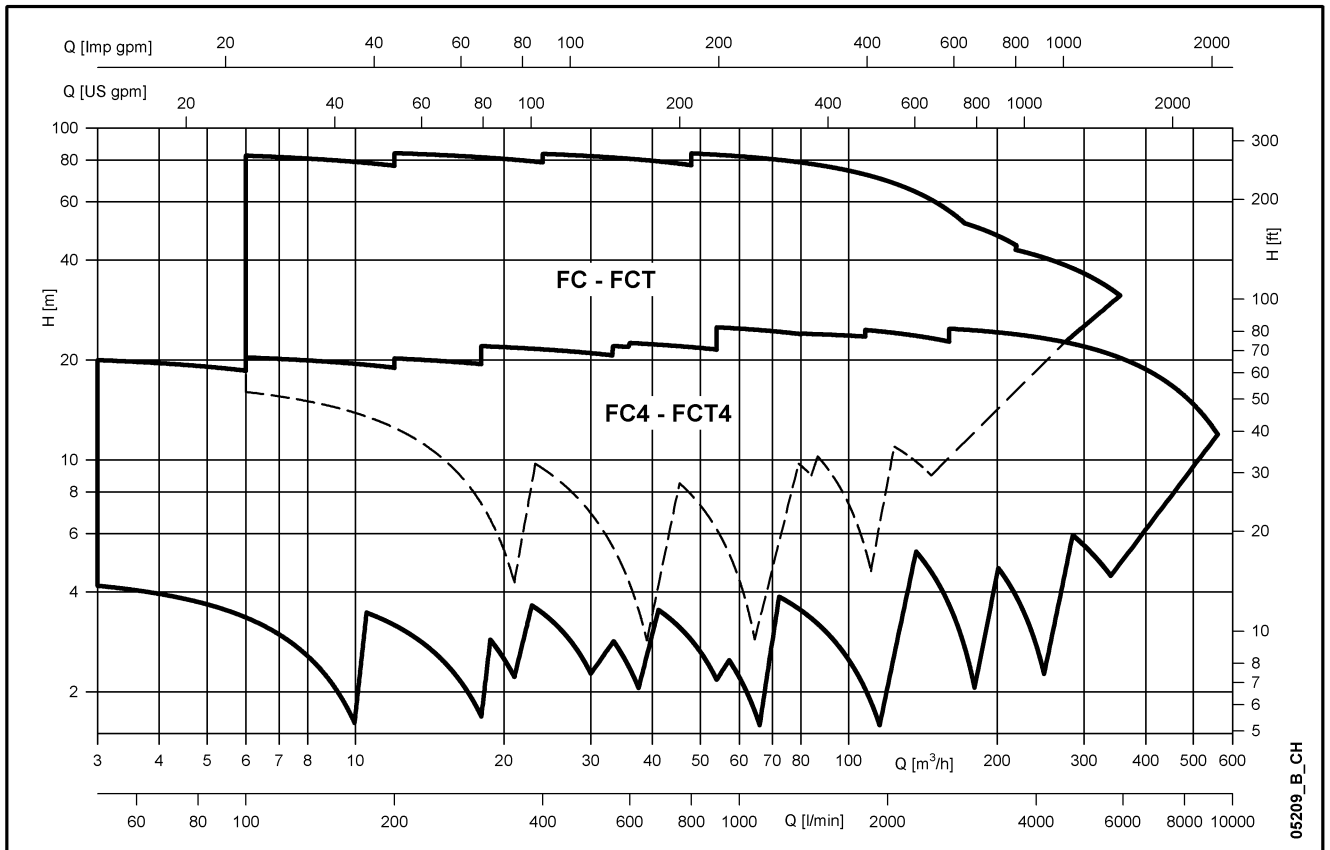


IN-LINE ELECTRIC PUMPS SINGLE AND TWIN



50 Hz

FC-FCT SERIES



EDITION 03-2006

05209_B_CH

Lowara

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In-Line Electric Pumps

FC Series



MARKET SECTORS

LIGHT INDUSTRY, COMMERCIAL BUILDING SERVICES

APPLICATIONS

- Water circulation in heating and air conditioning systems
- Handling of water and clean, chemically non-aggressive liquids.
- Water supply.
- Irrigation.



SPECIFICATIONS

PUMP

- **Delivery** up to 190 m³/h for 2-pole.
330 m³/h for 4-pole.
- **Head** up to 89 m, 2-pole (35 m, 4-pole).
- **Temperature of pumped liquid:** -10 ÷ 130 °C for the "E" version,
-20 ÷ 140 °C for the "S" version (depending on working pressure).
- **Maximum working pressure:**
10 bar (PN10) for the "E" version,
16 bar (PN 16) for the "S" version up to 120°C, 13 bar from 120°C to 140°C.
- **Impeller** made of AISI 316L stainless steel, **laser technology** welded, up to size 80-160.
Cast iron impeller for bigger sizes.
Bronze impeller available on request for FCT 80-200 and bigger, in both the "E" and "S" versions.
- **Wear rings** made of AISI 316L stainless steel, up to FC 100, on the impeller's front and rear wear plates, to ensure high performance and easy replacement.
- **Mechanical seal** according to EN 12756 (ex DIN 24960), lubricated by internal recirculation of pumped liquid to seal housing.

(up to FC 100).

Mechanical seal locking pin slot on models up to FC 100 (on request).

- Air valve on models up to FC 100.
- Counterflange kits available on request.

MOTOR

- Three-phase asynchronous, squirrel cage rotor, enclosed construction, external ventilation.
- **IP55 protection.**
- **Class F insulation.**
- Performances according to EN 60034-1.
- Maximum ambient **temperature:** 40°C.
- Condensate drain plugs on all Lowara motors.
- **Standard voltage:**
- **Single-phase** version 220-240 V 50 Hz, with built-in automatic reset overload protection up to 1.5 kW. For higher powers the protection is provided by the user.
- **Three-phase** version 230/400 V 50 Hz for powers up to 3 kW;
400/690 V 50 Hz for powers above 3 kW.
Overload protection to be provided by the user.
- The Lowara surface motors have efficiency values that fall within the range normally referred to as efficiency class 2.
- **Type of motor used:**
2-pole
Single-phase: LOWARA SM (up to 1.5 kW)
LOWARA LM (above 1.5 kW)
Three-phase: LOWARA SM (up to 2.2 kW)
LOWARA LM (above 2.2 kW)
- **4-pole**
Three-phase: LOWARA LM (up to 7.5 kW)
MARELLI (from 11 to 22 kW)

CONSTRUCTION FEATURES

Single-impeller centrifugal pump with in-line suction and delivery flanges.

Flanges in compliance with UNI EN 1092-2 (ex UNI 2236) and DIN 2532.

Back pull-out design; (impeller, adapter and motor can be extracted without disconnecting the pump body from the pipes).

FCE SERIES CHARACTERISTICS

Pump coupling: close-coupled by means of an adapter, with impeller keyed directly to the motor shaft extension.

Maximum operating pressure: **10 bar (PN 10)**

Temperature of pumped liquid: -10°C to 130°C.

FCS SERIES CHARACTERISTICS

Pump coupling: by adapter, with bracket and rigid coupling keyed to the shaft extension of standard motors.

Maximum operating pressure: **16 bar (PN 16)** up to 120°C, 13 bar from 120°C to 140°C.

Temperature of pumped liquid: -20°C to 140°C.

FC..H SERIES CHARACTERISTICS

Variable speed control, using the HYDROVAR® and HYDROVAR® Sensorless (on request) control system, is recommended for managing pump operation according to system conditions. This ensures energy savings, lower operating costs, greater comfort and environmental protection.

This option is available for both the FCE and FCS series, and includes the HYDROVAR® and HYDROVAR® Sensorless (on request) controller and sensors.

ACCESSORIES ON REQUEST

Threaded steel or galvanized iron counterflanges.

Pump support.

Blind flange

OPTIONAL FEATURES

Different voltages and frequencies.

Different materials for the mechanical seal and pump body seal.

Support available for vertical mounting (where added).

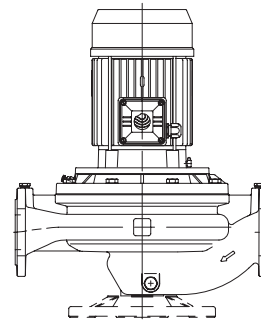
Motors Eff. 1 (for FCS series).

INSTALLATION

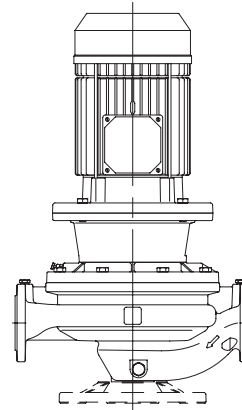
Installed in horizontal or vertical piping, in any position except with motor or terminal box facing downward.

Motor powers 5.5 kW and higher, for installations with motor shaft in the vertical position, the electric pump should be mounted on a base, the pump should rest on its feet or on the support foot (optional accessory). For installations with motor shaft in the horizontal position, use a support foot for the motor.

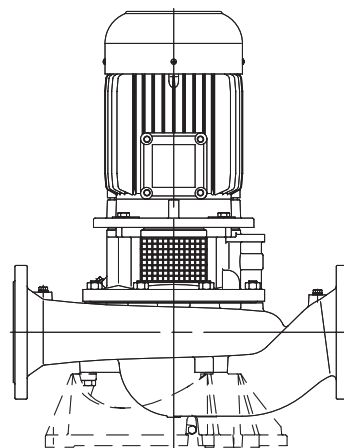
FCE 40-100
FCE4 40-100



FCS 40-100
FCS4 40-100



FCS4 125-150



04807_C_SC

In-Line Twin Electric Pumps

FCT Series



MARKET SECTORS

CIVIL, INDUSTRIAL

APPLICATIONS

- Water circulation in heating and air conditioning systems.
- Handling of water and clean, chemically non-aggressive liquids.
- Water supply.
- Irrigation.

SPECIFICATIONS

PUMP

- **Delivery** with one pump running: up to 190 m³/h with 2-pole motor, up to 330 m³/h with 4-pole motor; with two pumps running: up to 350 m³/h with 2-pole motor, up to 610 m³/h with 4-pole motor.
- **Head** up to 89 m with 2-pole motor, up to 35 m with 4-pole motor.
- **Temperature of pumped liquid:** -10 ÷ 130 °C for the "E" version, -20 ÷ 140 °C for the "S" version (depending on working pressure).
- **Maximum working pressure:** 10 bar (PN10) for the "E" version, 16 bar (PN 16) for the "S" version up to 120°C, 13 bar from 120°C to 140°C.
- **Impeller:** made of AISI 316L stainless steel, **laser technology** welded, up to size 80-160. Cast iron impeller for bigger sizes. Bronze impeller available on request for FCT 80-200 and bigger, in both the "E" and "S" versions.
- **Wear rings** made of AISI 316L stainless steel, up to FC 100, on the impeller's front and rear wear plates, to ensure high performance and easy replacement.
- **Mechanical seal** according to EN 12756 (ex DIN 24960), lubricated by internal recirculation

of pumped liquid to seal housing (up to FC 100) (on request).

- Air valve on models up to FC 100.
- Blind flange included.
- Counterflange kit available on request.

MOTOR

- Three-phase asynchronous, squirrel cage rotor, enclosed construction, external ventilation.
- **Protection class** IP55.
- Class F insulation.
- Performances according to EN 60034-1.
- **Maximum ambient temperature:** 40°C.
- Continuous duty.
- Condensate drain plugs on all Lowara motors.
- Standard voltage:
 - **Single-phase** version 220-240 V 50 Hz, with built-in automatic reset overload protection up to 1.5 kW. For higher powers the protection is provided by the user.
 - **Three-phase** versions 230/400 V 50 Hz for powers up to 3 kW, 400/690 V 50 Hz for powers above 3 kW. Overload protection to be provided by the user.
- The Lowara surface motors have efficiency values that fall within the range normally referred to as efficiency class 2.
- Type of motor used:
 - 2-pole
 - Single-phase: LOWARA SM (up to 1.5 kW)
 - LOWARA LM (above 1.5 kW)
 - Three-phase: LOWARA SM (up to 2.2 kW)
 - LOWARA LM (above 2.2 kW)
- 4-pole
 - Three-phase: LOWARA LM (up to 7.5 kW)
 - MARELLI (from 11 to 22 kW)

Lowara



CONSTRUCTION FEATURES

Two single-impeller centrifugal pumps featuring in-line suction and delivery flanges, with automatic changeover valve. The two pumps can operate separately or in parallel.

Flanges in compliance with UNI EN 1092-2 (ex UNI 2236) and DIN 2532.

Back pull-out design; (impeller, adapter and motor can be extracted without disconnecting the pump body from the pipes).

FCTE SERIES CHARACTERISTICS

Pump coupling: close-coupled by means of an adapter, with impeller keyed directly to the motor shaft extension.

Maximum operating pressure: 10 bar (PN 10)

Temperature of pumped liquid: -10°C to 130°C.

FCTS SERIES CHARACTERISTICS

Pump coupling: by adapter, with bracket and rigid coupling keyed to the shaft extension of standard motors.

Maximum operating pressure: 16 bar (PN 16) up to 120°C, 13 bar from 120°C to 140°C.

Temperature of pumped liquid: -20°C to 140°C.

FCT..H SERIES CHARACTERISTICS (ON REQUEST)

Variable speed control, using the HYDROVAR® and HYDROVAR® Sensorless control system, is recommended for managing pump operation according to system conditions. This ensures energy savings, lower operating costs, greater comfort and environmental protection.

This option is available for both the FCTE and FCTS series, and includes the HYDROVAR® and HYDROVAR® Sensorless controller and sensors.

ACCESSORIES ON REQUEST

Threaded steel or galvanized iron counterflanges.

Stand.

Blanking flange.

OPTIONAL FEATURES

Different voltages and frequencies.

Different materials for the mechanical seal and pump body seal.

Stand available for vertical mounting.

Version with frequency converter (variable speed).

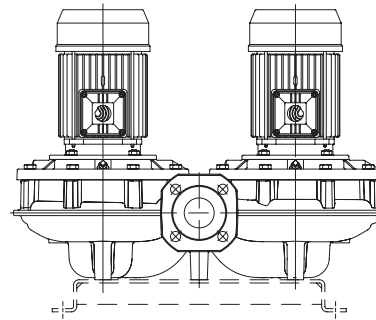
Motors Eff. 1 (for FCS series).

INSTALLATION

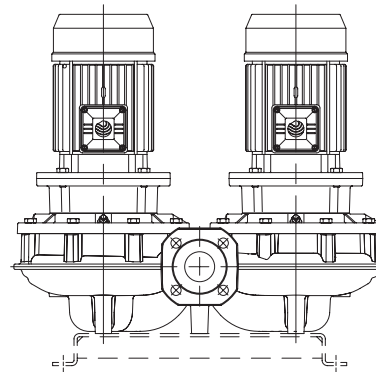
Can be installed on horizontal or vertical piping, in any position except with motor or terminal board facing downward.

With motor powers 5.5 kW and up, for installations with motor shaft in the vertical position, the electric pump should be mounted on a base, the pump should rest on its feet or on the support foot (optional accessory). For installations with motor shaft in the horizontal position, use a support for the motor.

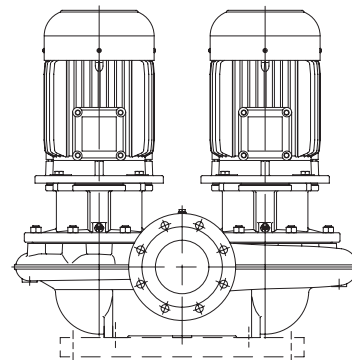
FCTE 40-100
FCTE4 40-100



FCTS 40-100
FCTS4 40-100



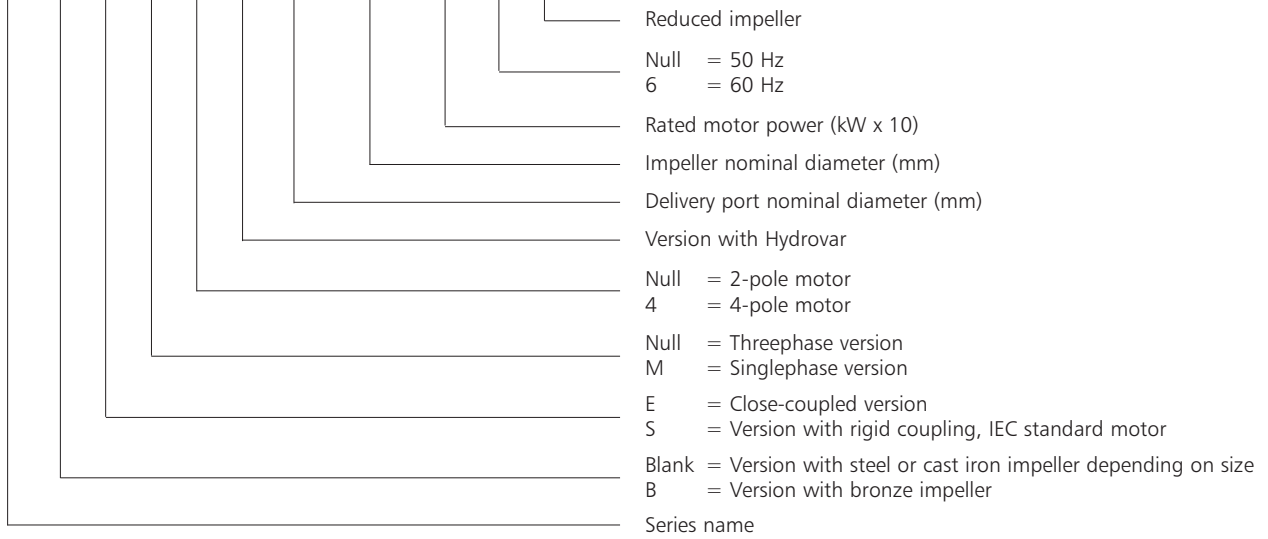
FCTS4 125-150



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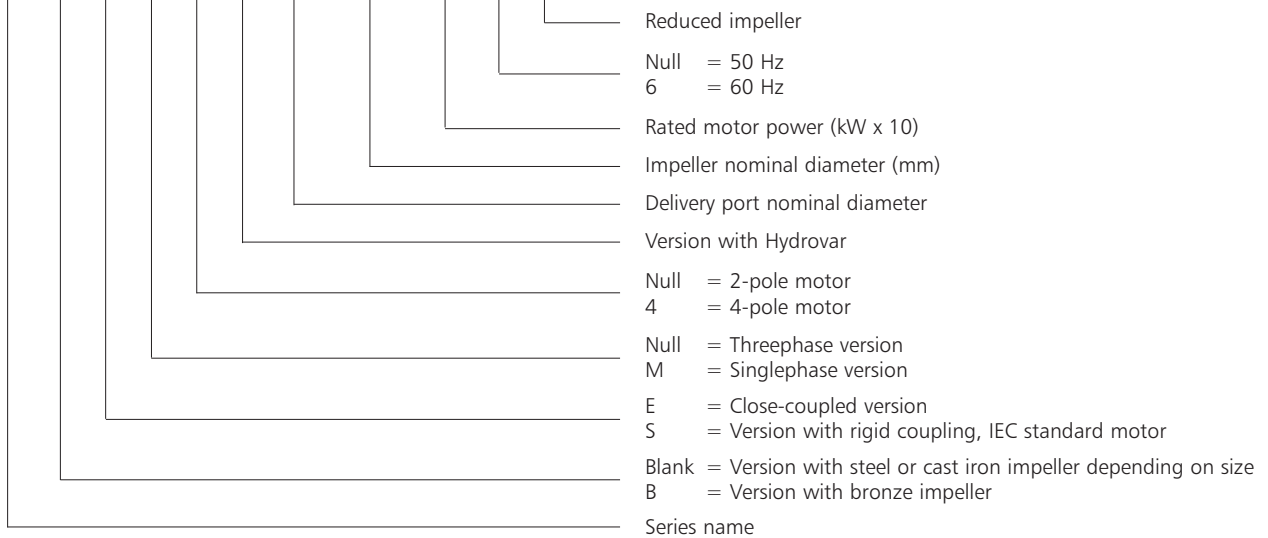
FC SERIES IDENTIFICATION CODE

FC B [] [] 4 H 40 - 200 / 40 6 A

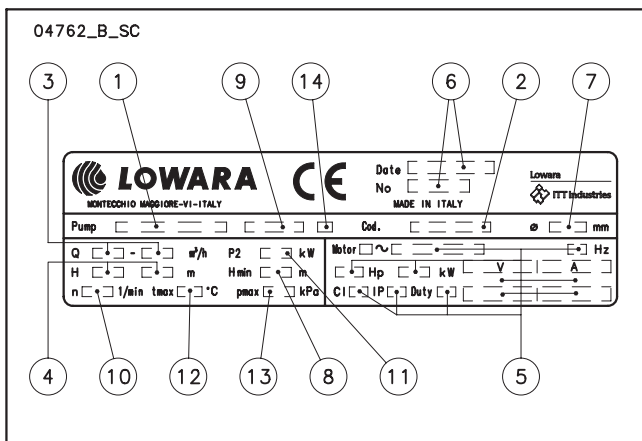


FCT SERIES IDENTIFICATION CODE

FCT B [] [] 4 H 40 - 200 / 40 6 A



RATING PLATE FC - FCT

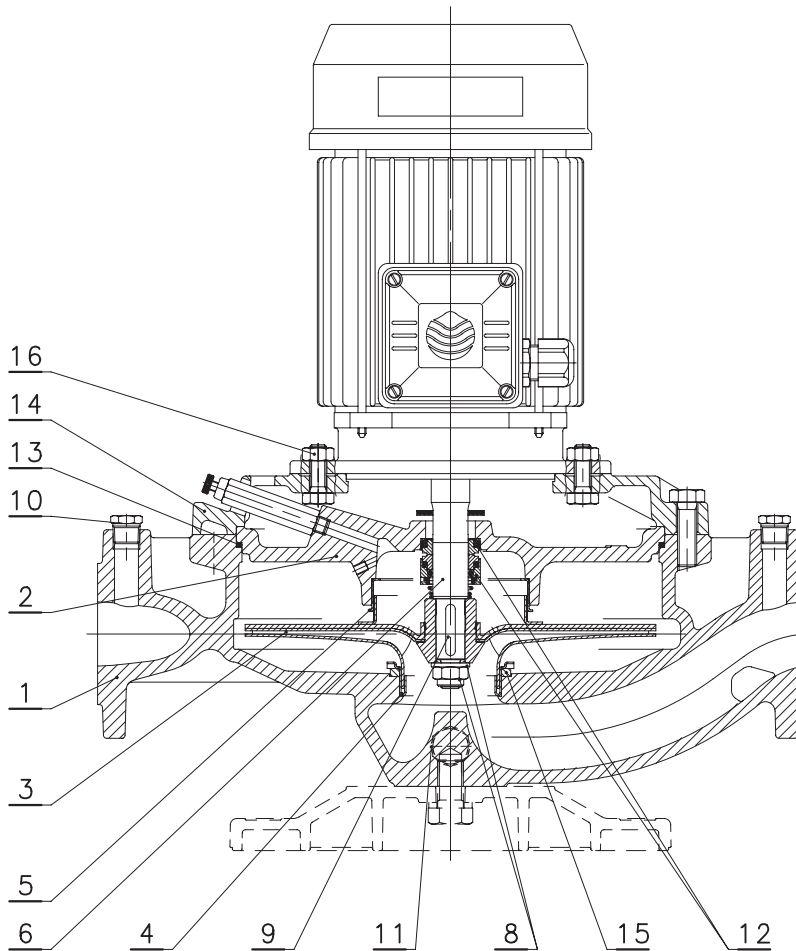


LEGEND

- 1 - Electric pump type
- 2 - Code
- 3 - Delivery range
- 4 - Head range
- 5 - Motor characteristics
- 6 - Date of manufacture and serial number
- 7 - Impeller diameter
- 8 - Minimum head
- 9 - Mechanical seal type
- 10 - Speed
- 11 - Rated output
- 12 - Maximum operating temperature
- 13 - Maximum operating pressure
- 14 - Type of gaskets

FCE-FCE4 SERIES LIST OF MODELS AND TABLE OF MATERIALS

04806_C_DS



VERSIONS	
2 POLES	4 POLES
FCE 40-125/07	FCE4 40-200/05
FCE 40-125/11	FCE4 40-200/07
FCE 40-160/15	FCE4 40-250/11
FCE 40-160/22	FCE4 40-250/15
FCE 40-200/40A	FCE4 50-160/05
FCE 40-200/40	FCE4 50-200/07
FCE 40-200/55	FCE4 50-200/11
FCE 40-250/75	FCE4 50-250/15
FCE 40-250/110	FCE4 50-250/22
FCE 50-125/11	FCE4 65-125/05
FCE 50-125/15	FCE4 65-160/07
FCE 50-160/22	FCE4 65-160/11
FCE 50-160/30	FCE4 65-200/15
FCE 50-160/40	FCE4 65-250/22
FCE 50-200/55	FCE4 65-250/30
FCE 50-200/75	FCE4 80-125/07
FCE 50-250/92	FCE4 80-125/11
FCE 50-250/110	FCE4 80-200/15
FCE 50-250/150	FCE4 80-200/22
FCE 65-125/22	FCE4 80-200/30
FCE 65-125/30	FCE4 80-250/40
FCE 65-125/40	FCE4 80-250/55
FCE 65-160/55	FCE4 100-160/15
FCE 65-160/75	FCE4 100-200/22
FCE 65-200/92	FCE4 100-200/30
FCE 65-200/110	FCE4 100-250/40
FCE 65-250/150	FCE4 100-250/55
FCE 65-250/185	FCE4 100-250/75
FCE 65-250/220	
FCE 80-125/30	
FCE 80-125/40	
FCE 80-125/55	
FCE 80-160/75	
FCE 80-200/110	
FCE 80-200/150	
FCE 80-200/185	
FCE 80-200/220	
FCE 100-160/110	
FCE 100-200/185	
FCE 100-200/220	

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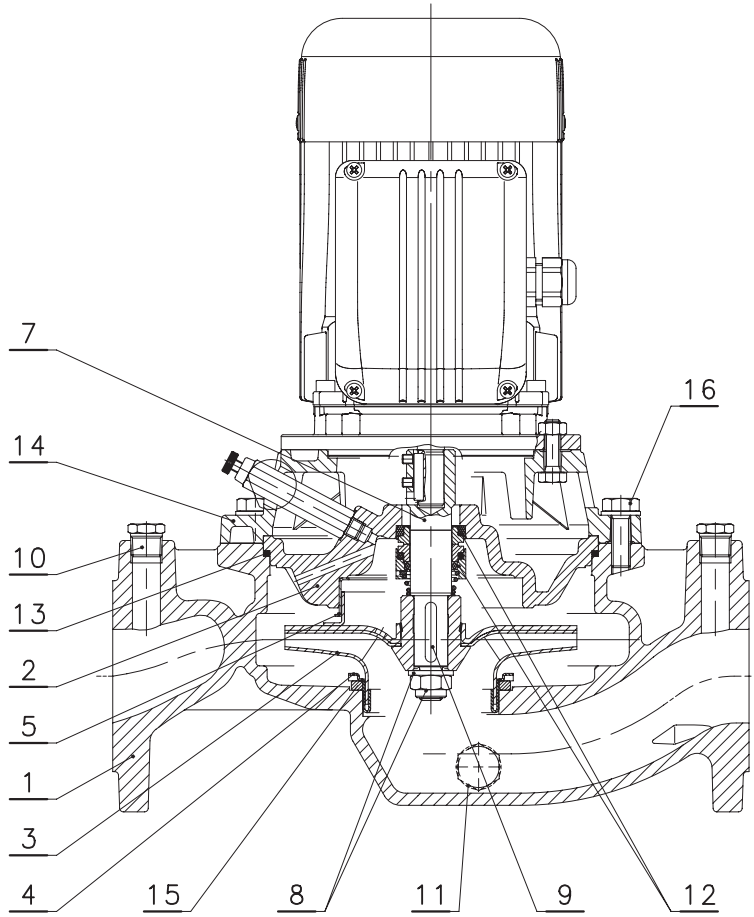
REF. N.	PART	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
2	Seal housing	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
3	Impeller	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
	Impeller	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
	Impeller	Bronze	EN 1982-CuSn10-C (CC480K)	UNS C90700
4	Wear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Counterwear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
6	Shaft extension	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Impeller lock nut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Key	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
10	Plugs and air valve	Nickel-plated brass	EN 12164-CuZn39Pb3 (CW614N)	-
11	Gaskets for fill/drain plugs	Aluminium	EN 573-AW-AI99,5 (AW1050A)	-
12	Mechanical seal	Carbon/Ceramic/EPDM (standard version)		
13	Elastomers	EPDM (standard version)		
14	Adapter *	Aluminium	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)	-
	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
15	Spacer ring	Painted steel		
16	Pump body fastening bolts and screws	Galvanized steel		

* For 40/50-125 2/4 pole and 40/50-160 2/4 pole versions

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**FCE4 SERIES
LIST OF MODELS AND TABLE OF MATERIALS**

04806A_B_DS



VERSIONS	
4 POLES	
FCE4 40-125/02A	
FCE4 40-125/02	
FCE4 40-160/02	
FCE4 40-160/03	
FCE4 50-125/02	
FCE4 50-125/03	
FCE4 65-125/03	

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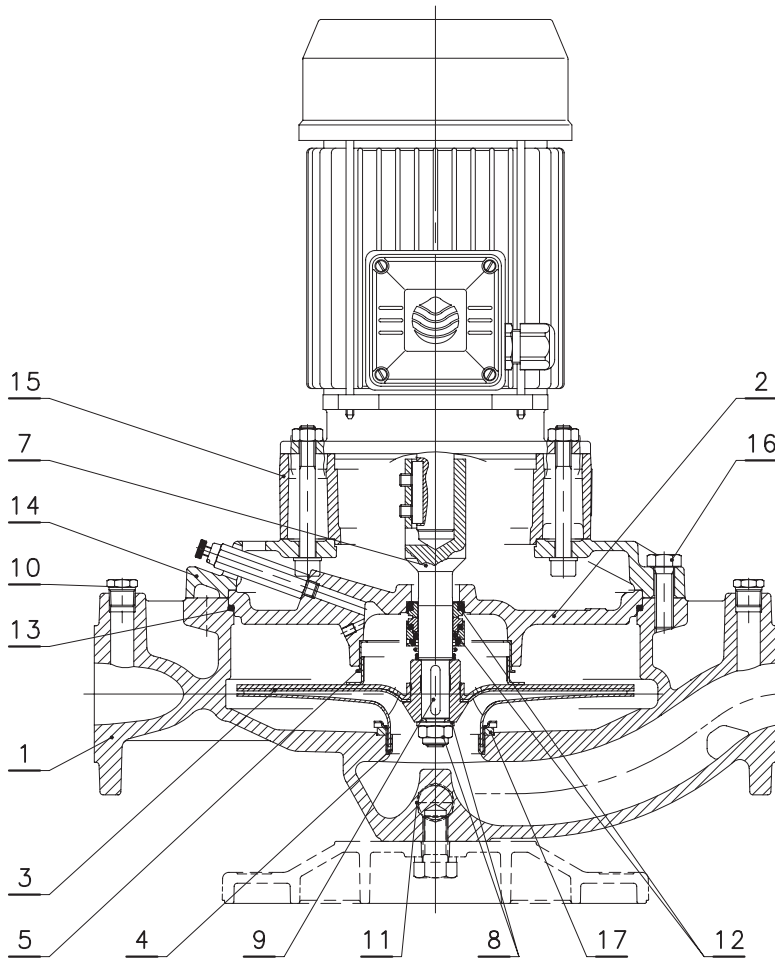
REF. N.	PART	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
2	Seal housing	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
3	Impeller	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
4	Wear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Counterwear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
7	Shaft rigid coupling	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Impeller lock nut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Key	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
10	Plugs and air valve	Nickel-plated brass	EN 12164-CuZn39Pb3 (CW614N)	-
11	Gaskets for fill/drain plugs	Aluminium	EN 573-AW-AI99,5 (AW1050A)	-
12	Mechanical seal	Carbon/Ceramic/EPDM (standard version)		
13	Elastomers	EPDM (standard version)		
14	Adapter *	Aluminium	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)	-
	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
15	Spacer ring	Painted steel		
16	Pump body fastening bolts and screws	Galvanized steel		

* For 40/50-125 2/4 pole and 40/50-160 2/4 pole versions

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FCS-FCS4 SERIES LIST OF MODELS AND TABLE OF MATERIALS

04856_C_DS



VERSIONS	
2 POLES	4 POLES
FCS 40-125/07	FCS4 40-200/05
FCS 40-125/11	FCS4 40-200/07
FCS 40-160/15	FCS4 40-250/11
FCS 40-160/22	FCS4 40-250/15
FCS 40-200/30	FCS4 50-200/07
FCS 40-200/40	FCS4 50-200/11
FCS 40-200/55	FCS4 50-250/15
FCS 40-250/75	FCS4 50-250/22
FCS 40-250/110	FCS4 65-160/07
FCS 50-125/11	FCS4 65-160/11
FCS 50-125/15	FCS4 65-200/15
FCS 50-160/22	FCS4 65-250/22
FCS 50-160/30	FCS4 65-250/30
FCS 50-160/40	FCS4 80-125/07
FCS 50-200/55	FCS4 80-125/11
FCS 50-200/75	FCS4 80-200/15
FCS 50-250/110A	FCS4 80-200/22
FCS 50-250/110	FCS4 80-200/30
FCS 50-250/150	FCS4 80-250/40
FCS 65-125/22	FCS4 80-250/55
FCS 65-125/30	FCS4 100-160/15
FCS 65-125/40	FCS4 100-200/22
FCS 65-160/55	FCS4 100-200/30
FCS 65-160/75	FCS4 100-250/40
FCS 65-200/110A	FCS4 100-250/55
FCS 65-200/110	FCS4 100-250/75
FCS 65-250/150	
FCS 65-250/185	
FCS 65-250/220	
FCS 80-125/30	
FCS 80-125/40	
FCS 80-125/55	
FCS 80-160/75	
FCS 80-200/110	
FCS 80-200/150	
FCS 80-200/185	
FCS 80-200/220	
FCS 100-160/110	
FCS 100-200/185	
FCS 100-200/220	

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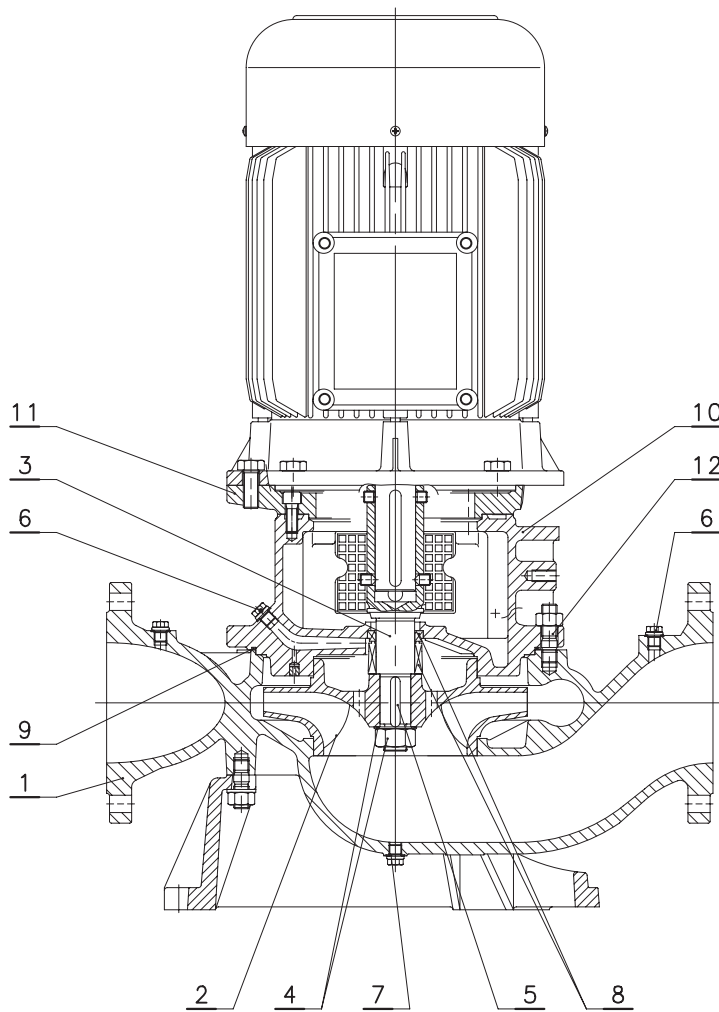
REF. N.	PART	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
2	Seal housing	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
3	Impeller	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
	Impeller	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
	Impeller	Bronze	EN 1982-CuSn10-C (CC480K)	UNS C90700
4	Wear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Counterwear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
7	Shaft rigid coupling	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Impeller lock nut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Key	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
10	Plugs and air valve	Nickel-plated brass	EN 12164-CuZn39Pb3 (CW614N)	-
11	Gaskets for fill/drain plugs	Aluminium	EN 573-AW-AI99,5 (AW1050A)	-
12	Mechanical seal	Carbon/Silicon carbide/EPDM (standard version)		
13	Elastomers	EPDM (standard version)		
14	Adapter *	Aluminium	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)	-
	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
15	Motor adapter coupling	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
16	Pump body fastening bolts and screws	Galvanized steel		
16	Spacer ring	Painted steel		

* For 40/50-125 2/4 pole and 40/50-160 2/4 pole versions

fc_fcs-fcs4- 40-100_a_tm

**FCS4 SERIES
LIST OF MODELS AND TABLE OF MATERIALS**

04857_B_DS



VERSIONS 4 POLES	
FCS4 125-160/30	
FCS4 125-200/40	
FCS4 125-200/55	
FCS4 125-250/75	
FCS4 125-250/110	
FCS4 125-315/150	
FCS4 125-315/185	
FCS4 125-315/220	
FCS4 150-200/55	
FCS4 150-200/75	
FCS4 150-250/110	
FCS4 150-250/150	
FCS4 150-250/185	

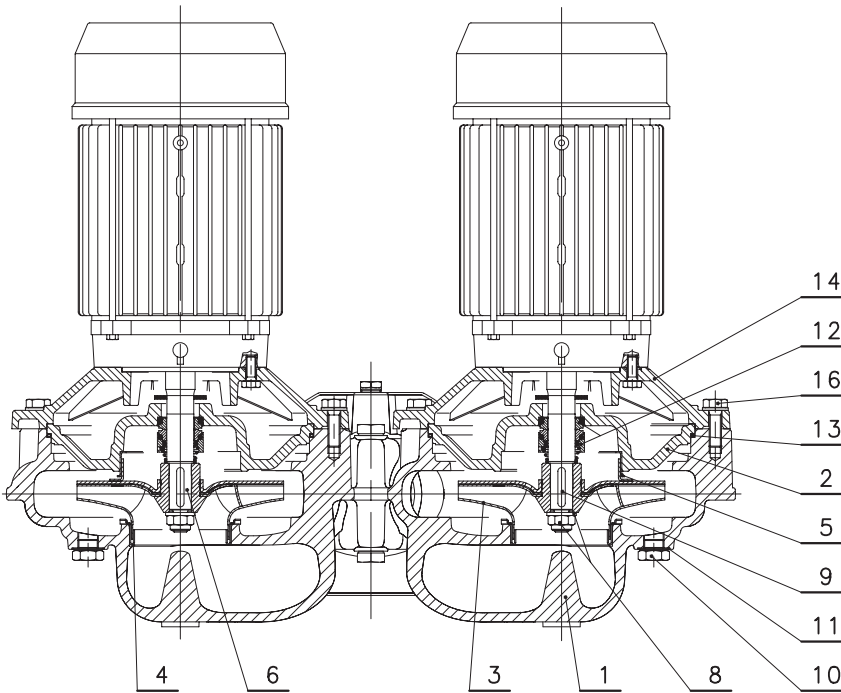
lmr-fcs4-125-150_a_mo

REF. N.	PART	MATERIALS	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
2	Impeller	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
		Bronze	EN 1982-CuSn10-C (CC480K)	UNS C90700
3	Rigid coupling	Stainless steel	EN 10088-1-X20Cr13 (1.4021)	AISI 420
4	Impeller lock nut and washer	Steel		
5	Key	Steel	EN 10083-1-C45E (1.1191)	-
6	Plugs and air valve	Steel		
7	Gaskets for plugs	Asbestos-free synthetic fibre AFM34 ®		
8	Mechanical seal	Silicon carbide/Carbon/EPDM (standard version)		
9	Elastomers	EPDM (standard version)		
10	Adapter	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
11	Motor adapter coupling	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
12	Pump body fastening bolts and screws	Steel		

lmr_fcs4 125-150_a_tm

FCTE-FCTE4 SERIES LIST OF MODELS AND TABLE OF MATERIALS

05202_A_DS



VERSIONS	
2 POLES	4 POLES
FCTE 40-125/07	FCTE4 40-200/05
FCTE 40-125/11	FCTE4 40-200/07
FCTE 40-160/15	FCTE4 40-250/11
FCTE 40-160/22	FCTE4 40-250/15
FCTE 40-200/40A	FCTE4 50-160/05
FCTE 40-200/40	FCTE4 50-200/07
FCTE 40-200/55	FCTE4 50-200/11
FCTE 40-250/75	FCTE4 50-250/15
FCTE 40-250/110	FCTE4 50-250/22
FCTE 50-125/11	FCTE4 65-125/05
FCTE 50-125/15	FCTE4 65-160/07
FCTE 50-160/22	FCTE4 65-160/11
FCTE 50-160/30	FCTE4 65-200/15
FCTE 50-160/40	FCTE4 65-250/22
FCTE 50-200/55	FCTE4 65-250/30
FCTE 50-200/75	FCTE4 80-125/07
FCTE 50-250/92	FCTE4 80-125/11
FCTE 50-250/110	FCTE4 80-200/15
FCTE 50-250/150	FCTE4 80-200/22
FCTE 65-125/22	FCTE4 80-200/30
FCTE 65-125/30	FCTE4 80-250/40
FCTE 65-125/40	FCTE4 80-250/55
FCTE 65-160/55	FCTE4 100-160/15
FCTE 65-160/75	FCTE4 100-200/22
FCTE 65-200/92	FCTE4 100-200/30
FCTE 65-200/110	FCTE4 100-250/40
FCTE 65-250/150	FCTE4 100-250/55
FCTE 65-250/185	FCTE4 100-250/75
FCTE 65-250/220	
FCTE 80-125/30	
FCTE 80-125/40	
FCTE 80-125/55	
FCTE 80-160/75	
FCTE 80-200/110	
FCTE 80-200/150	
FCTE 80-200/185	
FCTE 80-200/220	
FCTE 100-160/110	
FCTE 100-200/185	
FCTE 100-200/220	

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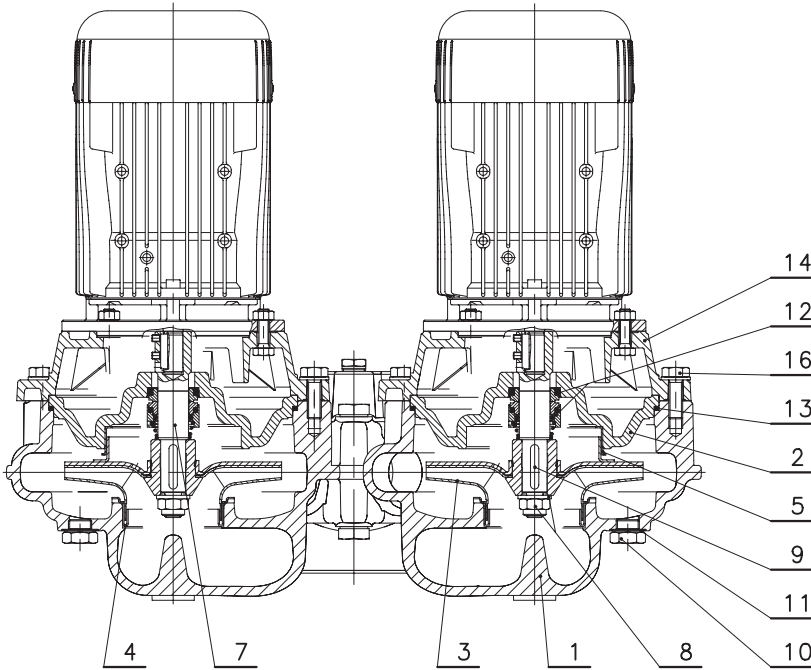
REF. N.	PART	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
2	Seal housing	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
3	Impeller	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
	Impeller	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
	Impeller	Bronze	EN 1982-CuSn10-C (CC480K)	UNS C90700
4	Wear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Counterwear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
6	Shaft extension	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Impeller lock nut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Key	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
10	Plugs and air valve	Nickel-plated brass	EN 12164-CuZn39Pb3 (CW614N)	-
11	Gaskets for fill/drain plugs	Aluminium	EN 573-AW-AI99,5 (AW1050A)	-
12	Mechanical seal	Carbon/Ceramic/EPDM (standard version)		
13	Elastomers	EPDM (standard version)		
14	Adapter*	Aluminium	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)	-
	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
16	Pump body fastening bolts and screws	Galvanized steel		
	Changeover valve	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L

* For 40/50-125 2/4 pole and 40/50-160 2/4 pole versions

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**FCTE4 SERIES
LIST OF MODELS AND TABLE OF MATERIALS**

05203_A_DS



VERSIONS 4 POLES	
FCTE4 40-125/02A	
FCTE4 40-125/02	
FCTE4 40-160/02	
FCTE4 40-160/03	
FCTE4 50-125/02	
FCTE4 50-125/03	
FCTE4 65-125/03	

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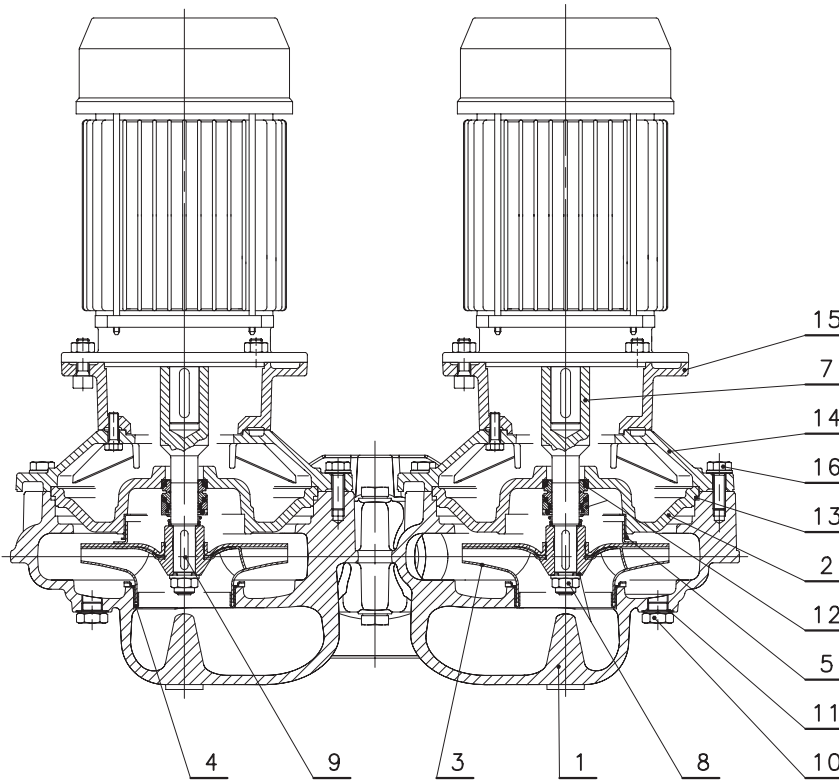
REF. N.	PART	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
2	Seal housing	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
3	Impeller	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
4	Wear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Counterwear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
7	Shaft rigid coupling	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Impeller lock nut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Key	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
10	Plugs and air valve	Nickel-plated brass	EN 12164-CuZn39Pb3 (CW614N)	-
11	Gaskets for fill/drain plugs	Aluminium	EN 573-AW-AI99,5 (AW1050A)	-
12	Mechanical seal	Carbon/Ceramic/EPDM (standard version)		
13	Elastomers	EPDM (standard version)		
14	Adapter *	Aluminium	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)	-
	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
16	Pump body fastening bolts and screws	Galvanized steel		
	Changeover valve	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L

* For 40/50-125 2/4 pole and 40/50-160 2/4 pole versions

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FCTS-FCTS4 SERIES LIST OF MODELS AND TABLE OF MATERIALS

05252_A_DS



VERSIONS	
2 POLES	4 POLES
FCTS 40-125/07	FCTS4 40-200/05
FCTS 40-125/11	FCTS4 40-200/07
FCTS 40-160/15	FCTS4 40-250/11
FCTS 40-160/22	FCTS4 40-250/15
FCTS 40-200/30	FCTS4 50-200/07
FCTS 40-200/40	FCTS4 50-200/11
FCTS 40-200/55	FCTS4 50-250/15
FCTS 40-250/75	FCTS4 50-250/22
FCTS 40-250/110	FCTS4 65-160/07
FCTS 50-125/11	FCTS4 65-160/11
FCTS 50-125/15	FCTS4 65-200/15
FCTS 50-160/22	FCTS4 65-250/22
FCTS 50-160/30	FCTS4 65-250/30
FCTS 50-160/40	FCTS4 80-125/07
FCTS 50-200/55	FCTS4 80-125/11
FCTS 50-200/75	FCTS4 80-200/15
FCTS 50-250/110A	FCTS4 80-200/22
FCTS 50-250/110	FCTS4 80-200/30
FCTS 50-250/150	FCTS4 80-250/40
FCTS 65-125/22	FCTS4 80-250/55
FCTS 65-125/30	FCTS4 100-160/15
FCTS 65-125/40	FCTS4 100-200/22
FCTS 65-160/55	FCTS4 100-200/30
FCTS 65-160/75	FCTS4 100-250/40
FCTS 65-200/110A	FCTS4 100-250/55
FCTS 65-200/110	FCTS4 100-250/75
FCTS 65-250/150	
FCTS 65-250/185	
FCTS 65-250/220	
FCTS 80-125/30	
FCTS 80-125/40	
FCTS 80-125/55	
FCTS 80-160/75	
FCTS 80-200/110	
FCTS 80-200/150	
FCTS 80-200/185	
FCTS 80-200/220	
FCTS 100-160/110	
FCTS 100-200/185	
FCTS 100-200/220	

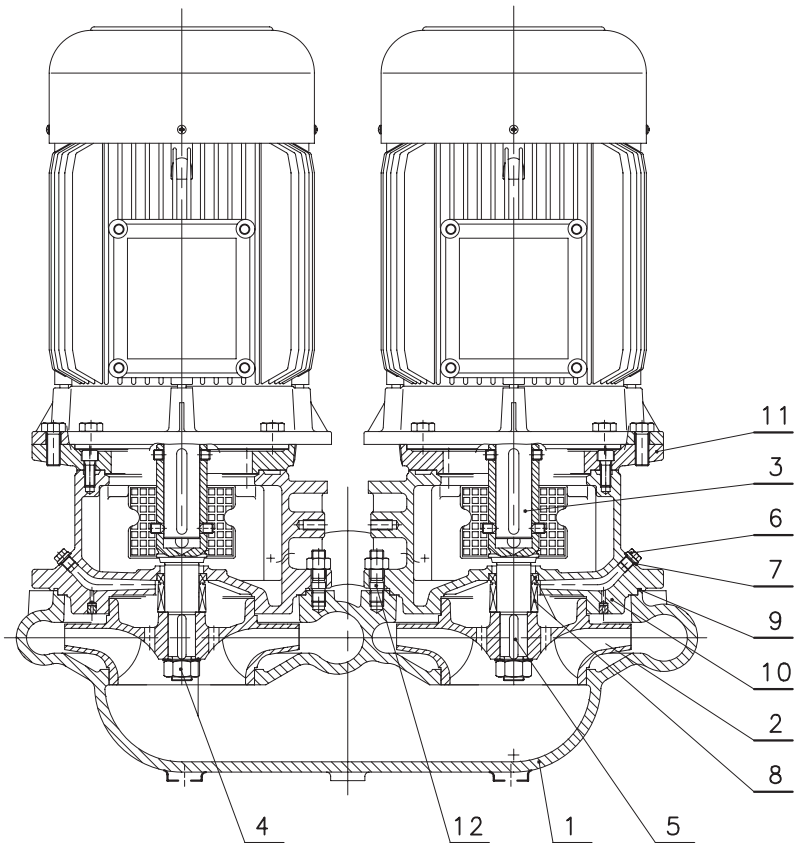
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REF. N.	PART	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
2	Seal housing	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
3	Impeller	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
	Impeller	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
	Impeller	Bronze	EN 1982-CuSn10-C (CC480K)	UNS C90700
4	Wear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Counterwear ring	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
7	Shaft rigid coupling	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
8	Impeller lock nut and washer	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
9	Key	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
10	Plugs and air valve	Nickel-plated brass	EN 12164-CuZn39Pb3 (CW614N)	-
11	Gaskets for fill/drain plugs	Aluminium	EN 573-AW-AI99,5 (AW1050A)	-
12	Mechanical seal	Carbon/Silicon carbide/EPDM (standard version)		
13	Elastomers	EPDM (standard version)		
14	Adapter*	Aluminium	EN 1706-AC-AISI11Cu2 (Fe) (AC46100)	-
	Adapter	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
15	Motor adapter coupling	Cast iron	EN 1561-GJL-200 (JL1030)	ASTM Class 25
16	Pump body fastening bolts and screws	Galvanized steel		
	Changeover valve	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L

* For 40/50-125 2/4 pole and 40/50-160 2/4 pole versions

**FCTS4 SERIES
LIST OF MODELS AND TABLE OF MATERIALS**

05251_A_DS



VERSIONS 4 POLES	
FCTS4 125-160/30	
FCTS4 125-200/40	
FCTS4 125-200/55	
FCTS4 125-250/75	
FCTS4 125-250/110	
FCTS4 150-200/55	
FCTS4 150-200/75	
FCTS4 150-250/110	
FCTS4 150-250/150	
FCTS4 150-250/185	

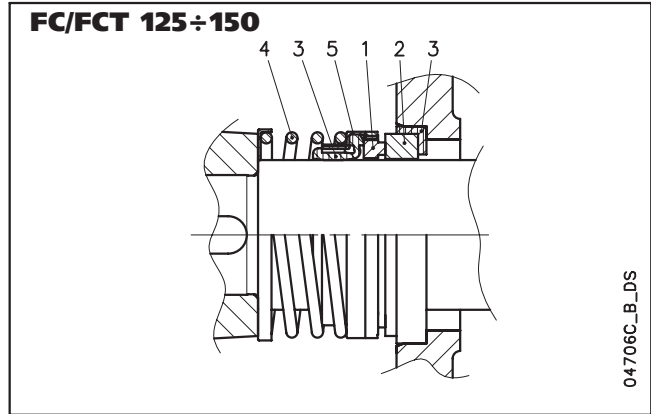
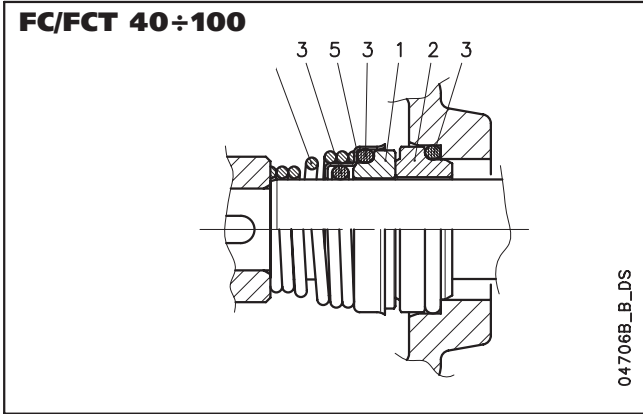
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REF. N.	PART	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
2	Impeller	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
		Bronze	EN 1982-CuSn10-C (CC480K)	UNS C90700
3	Rigid coupling	Stainless steel	EN 10088-1-X20Cr13 (1.4021)	AISI 420
4	Impeller lock nut and washer	Steel		
5	Key	Steel	EN 10083-1-C45E (1.1191)	-
6	Plugs and air valve	Steel		
7	Gaskets for plugs	Asbestos-free synthetic fibre AFM34 ®		
8	Mechanical seal	Silicon carbide/Carbon/EPDM (standard version)		
9	Elastomers	EPDM (standard version)		
10	Adapter	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
11	Motor adapter coupling	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
12	Pump body fastening bolts and screws	Steel		
	Changeover valve	Steel		

lmz_fcts4 125-150_b_tm

FC-FCT MECHANICAL SEAL, ACCORDING TO EN 12756

Mechanical seal mounting dimensions according to EN 12756 (ex DIN 24960) and ISO 3069.
 (A version with anti-rotation lockpin is available on request)



LIST OF MATERIALS

POSITION 1 - 2	POSITION 3	POSITION 4 - 5
Q ₁ : Silicon carbide	E : EPDM	G : AISI 316
B : Resin impregnated carbon	V : FPM	
V : Ceramic		

FCE - FCTE SEAL TYPE

fc-ct_ten-mec_a_tm

TYPE	POS.					TEMPERATURE (°C)
	1 ROTATING ASSEMBLY	2 FIXED ASSEMBLY	3 ELASTOMERS	4 SPRINGS	5 OTHER COMPONENTS	
STANDARD MECHANICAL SEAL						
V B E G G	V	B	E	G	G	-10 +130
OTHER TYPES OF MECHANICAL SEAL						
Q ₁ B E G G	Q ₁	B	E	G	G	-10 +130
Q ₁ Q ₁ E G G	Q ₁	Q ₁	E	G	G	-10 +130
Q ₁ B V G G	Q ₁	B	V	G	G	-10 +120
Q ₁ Q ₁ V G G	Q ₁	Q ₁	V	G	G	-10 +120

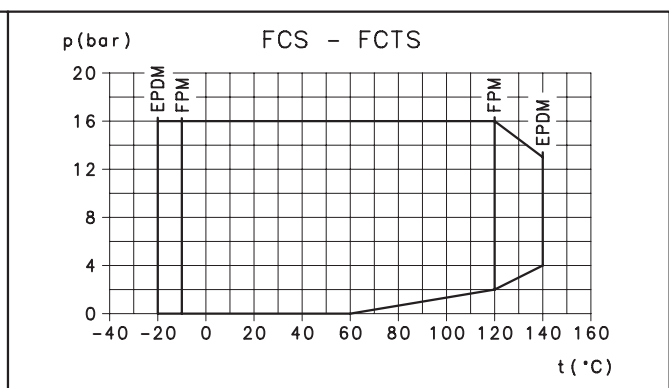
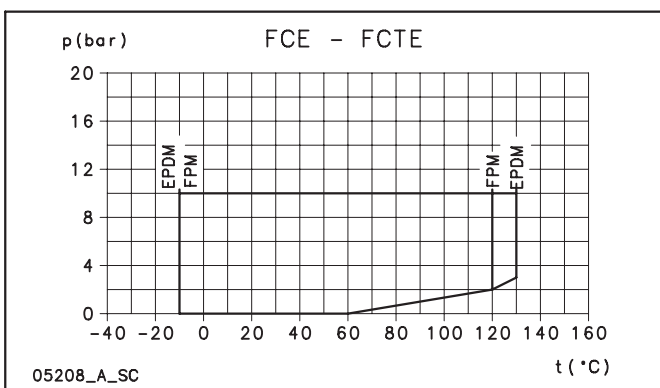
fc-fct_tipi-ten-mec_a_tc

FCS - FCTS SEAL TYPE

TYPE	POS.					TEMPERATURE (°C)
	1 ROTATING ASSEMBLY	2 FIXED ASSEMBLY	3 ELASTOMERS	4 SPRINGS	5 OTHER COMPONENTS	
STANDARD MECHANICAL SEAL						
Q ₁ B E G G	Q ₁	B	E	G	G	-20 +140
OTHER TYPES OF MECHANICAL SEAL						
Q ₁ Q ₁ E G G	Q ₁	Q ₁	E	G	G	-20 +140
Q ₁ B V G G	Q ₁	B	V	G	G	-10 +120
Q ₁ Q ₁ V G G	Q ₁	Q ₁	V	G	G	-10 +120

fcs-fcts_tipi-ten-mec_a_tc

PRESSURE/TEMPERATURE APPLICATION LIMITS FOR COMPLETE PUMP (WITH ANY OF THE SEALS LISTED ABOVE)



LIST OF FC SERIES MODELS 50 Hz

FC-FCT (2 POLES)

SIZE	kW	VERSION		
		FCEM FCTEM	FCE FCTE	FCS FCTS
40-125/07	0,75	•	•	•
40-125/11	1,1	•	•	•
40-160/15	1,5	•	•	•
40-160/22	2,2	•	•	•
40-200/30	3	-	-	•
40-200/40A	4	-	•	-
40-200/40	4	-	•	•
40-200/55	5,5	-	•	•
40-250/75	7,5	-	•	•
40-250/110	11	-	•	•
50-125/11	1,1	•	•	•
50-125/15	1,5	•	•	•
50-160/22	2,2	•	•	•
50-160/30	3	-	•	•
50-160/40	4	-	•	•
50-200/55	5,5	-	•	•
50-200/75	7,5	-	•	•
50-250/92	9,2	-	•	-
50-250/110A	11	-	-	•
50-250/110	11	-	•	•
50-250/150	15	-	•	•
65-125/22	2,2	•	•	•
65-125/30	3	-	•	•
65-125/40	4	-	•	•
65-160/55	5,5	-	•	•
65-160/75	7,5	-	•	•
65-200/92	9,2	-	•	-
65-200/110A	11	-	-	•
65-200/110	11	-	•	•
65-250/150	15	-	•	•
65-250/185	18,5	-	•	•
65-250/220	22	-	•	•
80-125/30	3	-	•	•
80-125/40	4	-	•	•
80-125/55	5,5	-	•	•
80-160/75	7,5	-	•	•
80-200/110	11	-	•	•
80-200/150	15	-	•	•
80-200/185	18,5	-	•	•
80-200/220	22	-	•	•
100-160/110	11	-	•	•
100-200/185	18,5	-	•	•
100-200/220	22	-	•	•

• = Available

fc_fce-fcs_2p50_b_tem

FC.4 - FCT.4 (4 POLES)

SIZE	kW	VERSION		
		FCE4 FCTE4	FCS4	FCTS4
40-125/02A	0,25	•	-	-
40-125/02	0,25	•	-	-
40-160/02	0,25	•	-	-
40-160/03	0,37	•	-	-
40-200/05	0,55	•	•	•
40-200/07	0,75	•	•	•
40-250/11	1,1	•	•	•
40-250/15	1,5	•	•	•
50-125/02	0,25	•	-	-
50-125/03	0,37	•	-	-
50-160/05	0,55	•	-	-
50-200/07	0,75	•	•	•
50-200/11	1,1	•	•	•
50-250/15	1,5	•	•	•
50-250/22	2,2	•	•	•
65-125/03	0,37	•	-	-
65-125/05	0,55	•	-	-
65-160/07	0,75	•	•	•
65-160/11	1,1	•	•	•
65-200/15	1,5	•	•	•
65-250/22	2,2	•	•	•
65-250/30	3	•	•	•
80-125/07	0,75	•	•	•
80-125/11	1,1	•	•	•
80-200/15	1,5	•	•	•
80-200/22	2,2	•	•	•
80-200/30	3	•	•	•
80-250/40	4	•	•	•
80-250/55	5,5	•	•	•
100-160/15	1,5	•	•	•
100-200/22	2,2	•	•	•
100-200/30	3	•	•	•
100-250/40	4	•	•	•
100-250/55	5,5	•	•	•
100-250/75	7,5	•	•	•
125-160/30	3	-	•	•
125-200/40	4	-	•	•
125-200/55	5,5	-	•	•
125-250/75	7,5	-	•	•
125-250/110	11	-	•	•
125-315/150	15	-	•	-
125-315/185	18,5	-	•	-
125-315/220	22	-	•	-
150-200/55	5,5	-	•	•
150-200/75	7,5	-	•	•
150-250/110	11	-	•	•
150-250/150	15	-	•	•
150-250/185	18,5	-	•	•

• = Available

fc_fce4-fcs4_4p50_b_tem

MOTORS

Squirrel cage motor in short circuit (TEFC), aluminum casing, enclosed construction with external ventilation. The standard supply features Lowara motors for powers up to 7.5 kW (included) in the 4-pole version, and up to 22 kW (included) in the 2-pole version. Other motor brands are used for higher powers.

The Lowara surface motors have efficiency values that fall within the range normally referred to as efficiency class 2.

Cooling is ensured by a fan according to EN 60034-6.

The terminal box is made of ABS technical polymer for motor sizes up to IM 100, and of aluminum alloy for bigger sizes.

The cable gland has standard passage dimensions according to EN 50262 (metric size) for SM motors, and according to DIN 46255 (PG size) for LM motors.

The standard protection is IP55, insulation class F.

Standard voltage:

- Single-phase version: 220-240 V 50 Hz, with incorporated automatic-reset overload protection up to 1.5 kW.
- Three-phase version: 230/400 V 50 Hz for powers up to 3 kW. 400/690 V 50 Hz for powers above 3 kW. Overload protection to be provided by the user.

FCE-FCTE SERIES SINGLE-PHASE 50 Hz, 2-POLE MOTORS

MOTOR TYPE			INPUT CURRENT I _n (A) 220-240 V	CAPACITOR		DATA FOR 230 V 50 Hz VOLTAGE					
kW	IEC SIZE *	CONSTRUCTION DESIGN		μF	V	rpm	I _s / I _n	n %	cosφ	C _n Nm	C _s /C _n
0,75	90R	B14	5.02-5.39	30	450	2875	5,10	70,6	0,91	2,49	0,71
1,1	90R	B14	7.07-6.81	30	450	2800	3,80	73,8	0,95	3,75	0,47
1,5	90R	B14	9.32-8.63	40	450	2780	3,45	75,5	0,97	5,15	0,47
2,2	90	B14	13.3-12.6	50	450	2785	3,45	76,9	0,97	7,54	0,36

* R = Reduced size of motor casing as compared to shaft extension and flange.

fhe-motm-2p50_a_te

FCE-FCTE SERIES THREE-PHASE 50 Hz, 2-POLE MOTORS

MOTOR TYPE			INPUT CURRENT I _n (A)				DATA FOR 400 V 50 Hz VOLTAGE					
kW	IEC SIZE *	CONSTRUCTION DESIGN	Δ		Y		rpm	I _s / I _n	n %	cosφ	C _n Nm	C _s /C _n
			220-240 V	380-415 V	380-415 V	660-690 V						
0,75	90R	B14	3,74	2,16	-	-	2915	8,23	77,7	0,65	2,45	5,20
1,1	90R	B14	4,52	2,61	-	-	2875	6,78	78,9	0,77	3,65	3,49
1,5	90R	B14	5,98	3,45	-	-	2875	7,04	80,1	0,78	4,98	3,83
2,2	90R	B14	8,71	5,03	-	-	2860	7,32	81,1	0,78	7,34	4,12
3	90	B14	10,4	6,01	-	-	2860	6,38	84,3	0,85	10,0	2,77
4	112R	B14	-	-	8,09	4,67	2890	7,70	85,3	0,84	13,2	2,80
5,5	112	B14	-	-	10,1	5,83	2900	9,62	87,0	0,90	18,1	3,91
7,5	112	B14	-	-	13,7	7,91	2900	9,73	88,1	0,90	24,7	3,99
9,2	132	B14	-	-	16,8	9,7	2930	9,15	89,7	0,88	30,0	4,31
11	132	B14	-	-	20,0	11,5	2925	8,98	89,7	0,88	35,9	3,43
15	160	B14	-	-	26,7	15,4	2940	8,72	89,7	0,90	48,7	3,49
18,5	160	B14	-	-	32,8	18,9	2945	9,49	90,7	0,90	60,0	3,27
22	160	B14	-	-	38,7	22,3	2940	9,16	91,3	0,90	71,4	3,20

* R = Reduced size of motor casing as compared to shaft extension and flange.

fce-fcte-mott-2p50_a_te

FCS-FCTS SERIES THREE-PHASE 50 Hz, 2-POLE MOTORS

MOTOR TYPE			INPUT CURRENT				DATA FOR 400 V 50 Hz VOLTAGE					
kW	IEC SIZE *	CONSTRUCTION DESIGN	In (A)				rpm	ls / ln	n %	cosφ	Cn Nm	Cs/Cn
			Δ 220-240 V	Y 380-415 V	Δ 380-415 V	Y 660-690 V						
0,75	80R	B5	3,50	2,02	-	-	2855	5,81	74,3	0,72	2,51	3,76
1,1	80	B5	4,52	2,61	-	-	2875	6,78	78,9	0,77	3,65	3,49
1,5	90R	B5	5,98	3,45	-	-	2875	7,04	80,1	0,78	4,98	3,83
2,2	90R	B5	8,71	5,03	-	-	2860	7,32	81,1	0,78	7,34	4,12
3	100R	B5	10,4	6,01	-	-	2860	6,38	84,3	0,85	10,0	2,77
4	112R	B5	-	-	8,09	4,67	2890	7,70	85,3	0,84	13,2	2,80
5,5	132R	B5	-	-	10,1	5,83	2900	9,62	87,0	0,90	18,1	3,91
7,5	132R	B5	-	-	13,7	7,91	2900	9,73	88,1	0,90	24,7	3,99
11	160R	B5	-	-	20	11,5	2925	8,98	89,7	0,88	35,9	3,43
15	160	B5	-	-	26,7	15,4	2940	8,72	89,7	0,90	48,7	3,49
18,5	160	B5	-	-	32,8	18,9	2945	9,49	90,7	0,90	60,0	3,27
22	160	B5	-	-	38,7	22,3	2940	9,16	91,3	0,90	71,4	3,20

* R = Reduced size of motor casing as compared to shaft extension and flange.

fcs-fcts-mott-2p50_b_te

FCE4-FCTE4 SERIES THREE-PHASE 50 Hz, 4-POLE MOTORS

MOTOR TYPE			INPUT CURRENT				DATA FOR 400 V 50 Hz VOLTAGE					
kW	IEC SIZE *	CONSTRUCTION DESIGN	In (A)				rpm	ls / ln	n %	cosφ	Cn Nm	Cs/Cn
			Δ 220-240 V	Y 380-415 V	Δ 380-415 V	Y 660-690 V						
0,25	71	B5	1,71	0,99	-	-	1390	3,58	62,0	0,59	1,71	3,16
0,37	71	B5	2,53	1,46	-	-	1370	3,39	61,4	0,60	2,57	3,40
0,55	90R	B14	3,03	1,75	-	-	1390	3,95	68,2	0,67	3,77	2,45
0,75	90R	B5	4,04	2,33	-	-	1395	4,06	70,1	0,66	5,13	2,73
1,1	90	B5	4,42	2,55	-	-	1415	4,48	78,2	0,80	7,42	2,14
1,5	90	B5	5,84	3,37	-	-	1415	5,10	81,0	0,79	10,1	2,43
2,2	100	B5	8,16	4,71	-	-	1420	5,52	83,1	0,81	14,8	2,36
3	100	B5	11,1	6,38	-	-	1425	6,13	84,1	0,81	20,1	2,69
4	112	B5	-	-	8,39	4,84	1440	6,47	85,5	0,81	26,5	2,69
5,5	132	B14	-	-	11,4	6,58	1450	5,71	87,2	0,80	36,2	2,56
7,5	132	B14	-	-	15,3	8,83	1445	6,14	88,0	0,81	49,5	2,93

* R = Reduced size of motor casing as compared to shaft extension and flange.

fhe-mott-4p50_a_te

FCS4-FCTS4 SERIES THREE-PHASE 50 Hz, 4-POLE MOTORS

MOTOR TYPE			INPUT CURRENT				DATA FOR 400 V 50 Hz VOLTAGE					
kW	IEC SIZE *	CONSTRUCTION DESIGN	In (A)				rpm	ls / ln	n %	cosφ	Cn Nm	Cs/Cn
			Δ 220-240 V	Y 380-415 V	Δ 380-415 V	Y 660-690 V						
0,55	80	B5	3,03	1,75	-	-	1390	3,95	68,2	0,67	3,77	2,45
0,75	80	B5	4,04	2,33	-	-	1395	4,06	70,1	0,66	5,13	2,73
1,1	90	B5	4,42	2,55	-	-	1415	4,48	78,2	0,80	7,42	2,14
1,5	90	B5	5,84	3,37	-	-	1415	5,10	81,0	0,79	10,1	2,43
2,2	100	B5	8,16	4,71	-	-	1420	5,52	83,1	0,81	14,8	2,36
3	100	B5	11,1	6,38	-	-	1425	6,13	84,1	0,81	20,1	2,69
4	112	B5	-	-	8,39	4,84	1440	6,47	85,5	0,81	26,5	2,69
5,5	132	B5	-	-	11,4	6,58	1450	5,71	87,2	0,80	36,2	2,56
7,5	132	B5	-	-	15,3	8,83	1445	6,14	88,0	0,81	49,5	2,93
11	160	B5	-	-	22,5	13,0	1460	5,20	88,6	0,80	72	2,00
15	160	B5	-	-	30,0	17,3	1460	5,90	89,8	0,80	98	2,30
18,5	180	B5	-	-	37,0	21,4	1465	6,20	90,2	0,80	120	2,30
22	180	B5	-	-	42,0	24,2	1465	6,30	90,8	0,83	143	2,40

* R = Reduced size of motor casing as compared to shaft extension and flange.

fcs4-fcts4-mott-4p50_b_te

MOTOR NOISE

The tables show the mean sound pressure (Lp) and sound power (LW) levels, measured at 1 meter distance in free field according to the A curve (according to ISO standard 1680).

The noise values are measured with idling 50 Hz motor with a tolerance of 3 dB (A).

MOTOR NOISE FCE/FCS/FCTE/FCTS 2 POLES 50 Hz

POWER	MOTOR TYPE	NOISE
kW	IEC SIZE *	LpA dB
0,75	90R	<70
1,1	90R	<70
1,5	90R	<70
2,2	90R	<70
3	90	<70
4	112R	<70
5,5	112	<70
7,5	112	<70
9,2	132	73
11	132	73
15	160	75
18,5	160	75
22	160	75

*R=Reduced size of motor casing as compared to shaft extension and flange

MOTOR NOISE FCE4/FCS4/ FCTE4/FCTS4 4 POLES 50 Hz

POWER	MOTOR TYPE	NOISE
kW	IEC SIZE *	LpA dB
0,25	71	<70
0,37	71	<70
0,55	90R	<70
0,75	90R	<70
1,1	90	<70
1,5	90	<70
2,2	100	<70
3	100	<70
4	112	<70
5,5	132	<70
7,5	132	<70
11	160	<70
15	160	<70
18,5	180	<70
22	180	<70

fce-fcs-fcte-fcts_mott_a_tr

FCH-FCTH SERIES ELECTRIC PUMPS WITH HYDROVAR® AND HYDROVAR® SENSORLESS CONTROL SYSTEM

We recommend the use of the FC-FCT series electric pumps combined with the HYDROVAR® and HYDROVAR® Sensorless devices.

HYDROVAR® and HYDROVAR® Sensorless are micro-processor controlled devices for pumping systems, designed to control pump operation according to system conditions and requirements.

This way the simple electric pump is transformed into a complete pumping system principally designed for air-conditioning and heating applications, adapting the differential pressure of the closed circuit to the requested load.

- **No special pumps or motors:**

HYDROVAR® is mounted directly onto a standard three-phase TEFC motor with class F insulation up to 22 kW power. (HYDROVAR® Sensorless up to 4 kW).

- HYDROVAR® Sensorless enables the control of an electric circulator pump by monitoring the power control, without requiring a differential pressure transmitter.

- **No separate control panels or converters:**

HYDROVAR® and HYDROVAR® Sensorless, perform all the functions of a pump control panel, incorporating protections against overload, short circuit, high temperature, etc. The only external device required is a fuse on the power supply line. Will depend upon any local electrical installation regulations.

- **No by-pass lines or safety systems:**

With HYDROVAR® the pump switches off immediately when demand is zero or exceeds the maximum capacity of the pump. This way there is no need to install additional safety devices.

- **The pump's operation at the correct speed based on system requirements enables energy consumption to be substantially reduced.**



GENERAL OPERATING PRINCIPLES OF THE HYDROVAR® SYSTEM

The basic function of the HYDROVAR® device is to control the pump to meet the system demands.

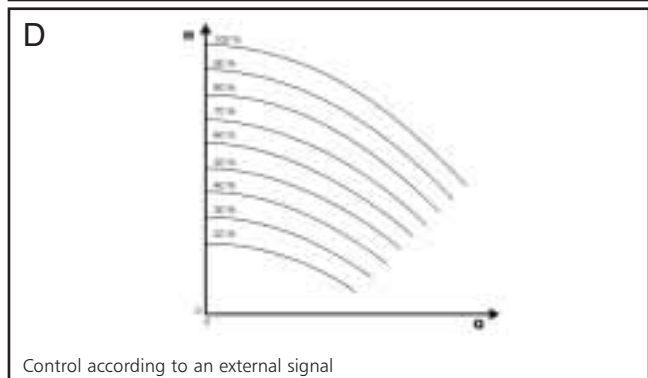
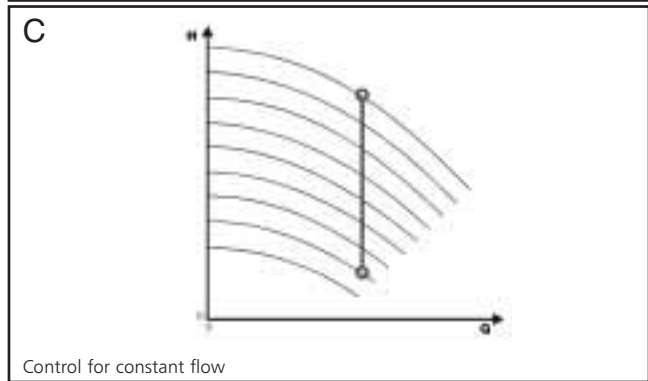
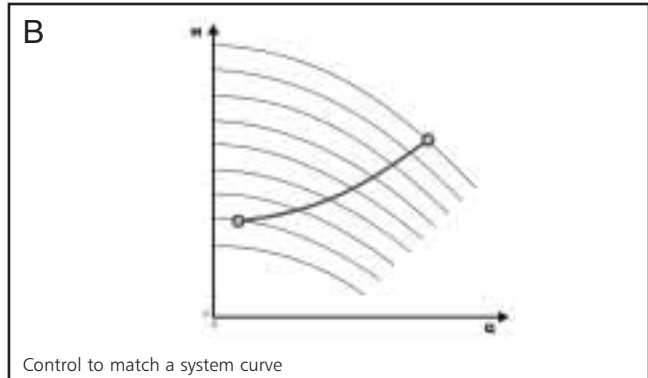
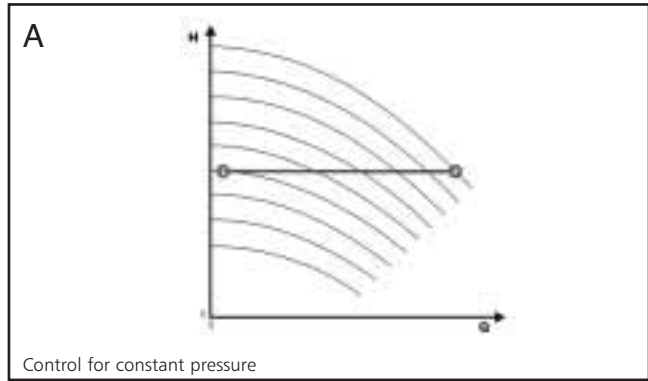
For the FC and FCT series electric pumps, typical operation consists in system regulation based on the characteristic curve (B).

HYDROVAR® performs these functions by:

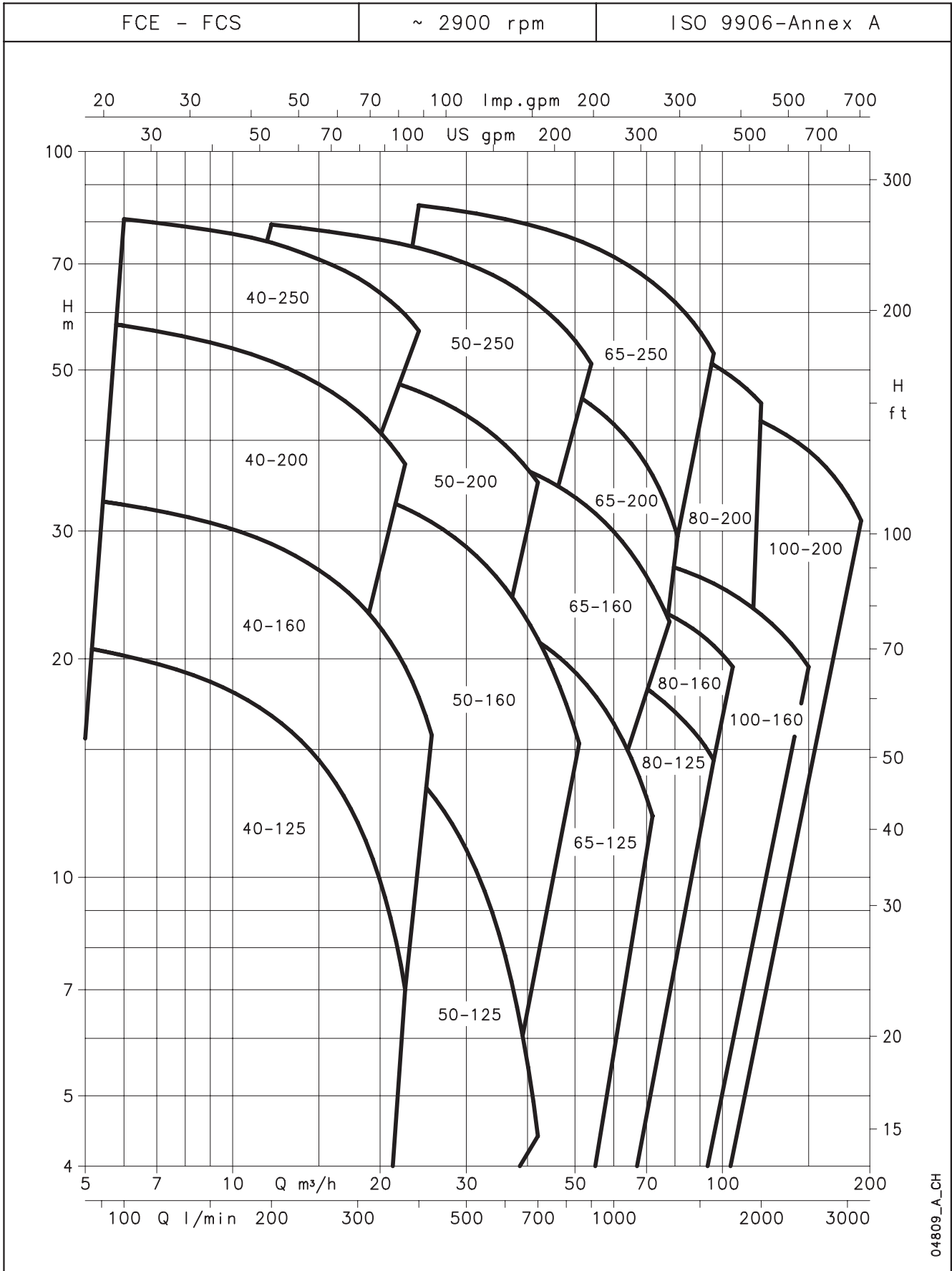
- 1) Measuring the system pressure or flow via a transmitter mounted on the pump's delivery side.
- 2) Calculating the motor speed to maintain the correct flow or pressure.
- 3) Sending out a signal to the pump to start the motor, increase speed, decrease speed or stop.
- 4) In the case of multiple pump installations, HYDROVAR® will automatically provide for the cyclic changeover of the pumps' starting sequence

In addition to these basic functions, HYDROVAR® can do things only by the most advanced computerised control systems, such as:

- Stop the pump(s) at zero demand.
- Stop the pump(s) in case of water failure on the suction side (protection against dry running).
- Stop the pump if the required delivery exceeds the pump's capacity (protection against cavitation caused by excessive demand), or automatically switch on the next pump in a multiple series.
- Protect the pump and motor from overvoltage, undervoltage, overload and earth fault.
- Vary the pump speed acceleration and deceleration time.
- Compensate for increased flow resistance at high flow rates.
- Conduct automatic test starts at set intervals.
- Monitor the converter and motor operating hours.
- Display all functions on an LCD in different languages (Italian, English, French, German, Spanish, Portuguese, Dutch).
- Send a signal to a remote control system which is proportional to the pressure and frequency.
- Communicate with another HYDROVAR or control system via an RS 485 interface.



**FCE-FCS SERIES
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 POLES**



The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

FCE-FCS SERIES HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

PUMP TYPE	RATED POWER		Q = DELIVERY																		
			l/min	100	200	350	375	400	600	700	800	850	1000	1200	1300	1500	1600	1750	1950	2500	3000
			m ³ /h	0	6	12	21	22,5	24	36	42	48	51	60	72	78	90	96	105	117	150
kW		HP	H = TOTAL HEAD METRES COLUMN OF WATER																		
40-125/07	0,75	1	17,0	15,1	11,8	3,6															
40-125/11	1,1	1,5	22,5	20	16,7	8,8	7														
40-160/15	1,5	2	27,3	24,7	20,9	13,1	11,2	9,3													
40-160/22	2,2	3	35,3	32,5	29	21	19,5	17,7													
40-200/ *	*	*	42,5	39	34																
40-200/40	4	5,5	51	47	41,5	30,5															
40-200/55	5,5	7,5	62	57,5	51,5	39,5	37														
40-250/75	7,5	10	75	71	65	53	51														
40-250/110	11	15	85	81	75	62	59,5	57													
50-125/11	1,1	1,5	15,3		13,5	11,1	10,6	10,1	5,4												
50-125/15	1,5	2	19,1		17,5	14,9	14,4	13,8	8,6	5,5											
50-160/22	2,2	3	26		24	21	20,6	20	14,7	11,6											
50-160/30	3	4	32,5		30,5	27,2	26,5	26	20	16,6	13										
50-160/40	4	5,5	38		36	38,9	32,2	31,5	25	21,4	17,3	15,5									
50-200/55	5,5	7,5	47		43,5	39,5	39	38	30,5												
50-200/75	7,5	10	56		52	48	47,5	46,5	39,5	35											
50-250/**	**	**	63,2		59,4	55,2	54,5	54	46,5	42,8	38										
50-250/110	11	15	69,5		65,5	61,3	60,5	60	53,5	49,3	45	42,5									
50-250/150	15	20	83		79,3	75	74,5	73,5	66	61,5	56,5	54									
65-125/22	2,2	3	18,5					16,5	14,3	13	11,3	10,5	7,9								
65-125/30	3	4	23					20,5	18,1	16,8	15	14,5	11,6								
65-125/40	4	5,5	26,5					24,5	22,5	21,2	19,3	18,8	16,3	12							
65-160/55	5,5	7,5	35					32,5	30	28,8	27	26,2	23,5	19							
65-160/75	7,5	10	42,5					40	37,5	36	34	33	30	25	22,5						
65-200/**	**	**	53					47,6	44	42	40	39	35	28,5	23,9						
65-200/110	11	15	61					55,3	51,5	49	47	46	42	36	31						
65-250/150	15	20	70					66,3	63	61	59	57,5	54	49	46	40					
65-250/185	18,5	25	80					75,3	72	70	67,5	66,5	63	57,5	54	48					
65-250/220	22	30	89					84,3	80,5	79	76,5	75,5	71,5	66	63	57	52,7				
80-125/30	3	4	15,5						14,5	14	13,5	13,2	12,5	11	10						
80-125/40	4	5,5	19						18	17,5	17	16,7	16	14	13,5	11,5					
80-125/55	5,5	7,5	23						21,5	21	20,5	20,2	19,5	18	17,3	15,5	14,5				
80-160/75	7,5	10	28						26,5	26	25,7	25,4	24,5	23,5	23	21,7	21	19,5			
80-200/110	11	15	41						37	36	35,2	34,8	33	30,5	29,5	26,2	24,5	22			
80-200/150	15	20	49,5						46,4	45,5	44,7	44,3	43	41	40	37,5	36,5	34	30,5		
80-200/185	18,5	25	57						53,5	52,5	51,5	51,2	50	48	47	44,7	43,5	41	38		
80-200/220	22	30	65						61,1	60	59,3	58,8	57,5	55,5	54	52	51	49	45,8		
100-160/110	11	15	29										28	27,3	26,8	26	25,4	24,6	23,4	19,5	
100-200/185	18,5	25	45											39,5	39	37,5	37,0	36	34,5	30,5	25
100-200/220	22	30	53											48	47	46	45	44	42,8	38,7	33,5

* FCE40-200/40A : 4 (kW) - 5.5 (HP) FCS40-200/30 : 3 (kW) - 4(HP)

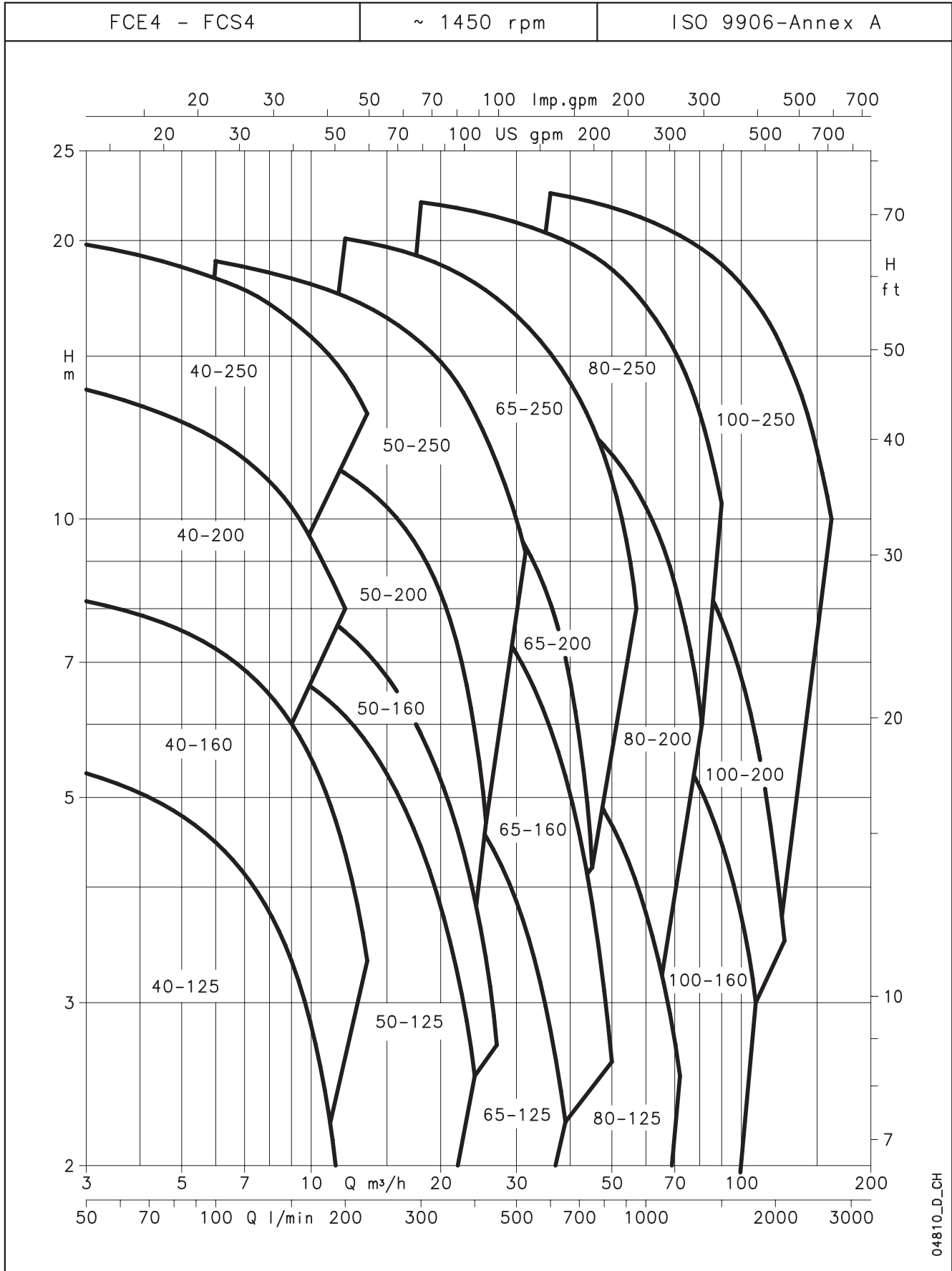
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** FCE50-250/92 : 9.2 (kW) - 12.5 (HP) FCS50-250/110A : 11 (kW) - 15 (HP)

FCE65-200/92 : 9.2 (kW) - 12.5 (HP) FCS65-200/110A : 11 (kW) - 15 (HP)

Performances according to ISO 9906 - Annex A.

**FCE4-FCS4 SERIES
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 4 POLES**



The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

FCE4-FCS4 SERIES

HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 4 POLES

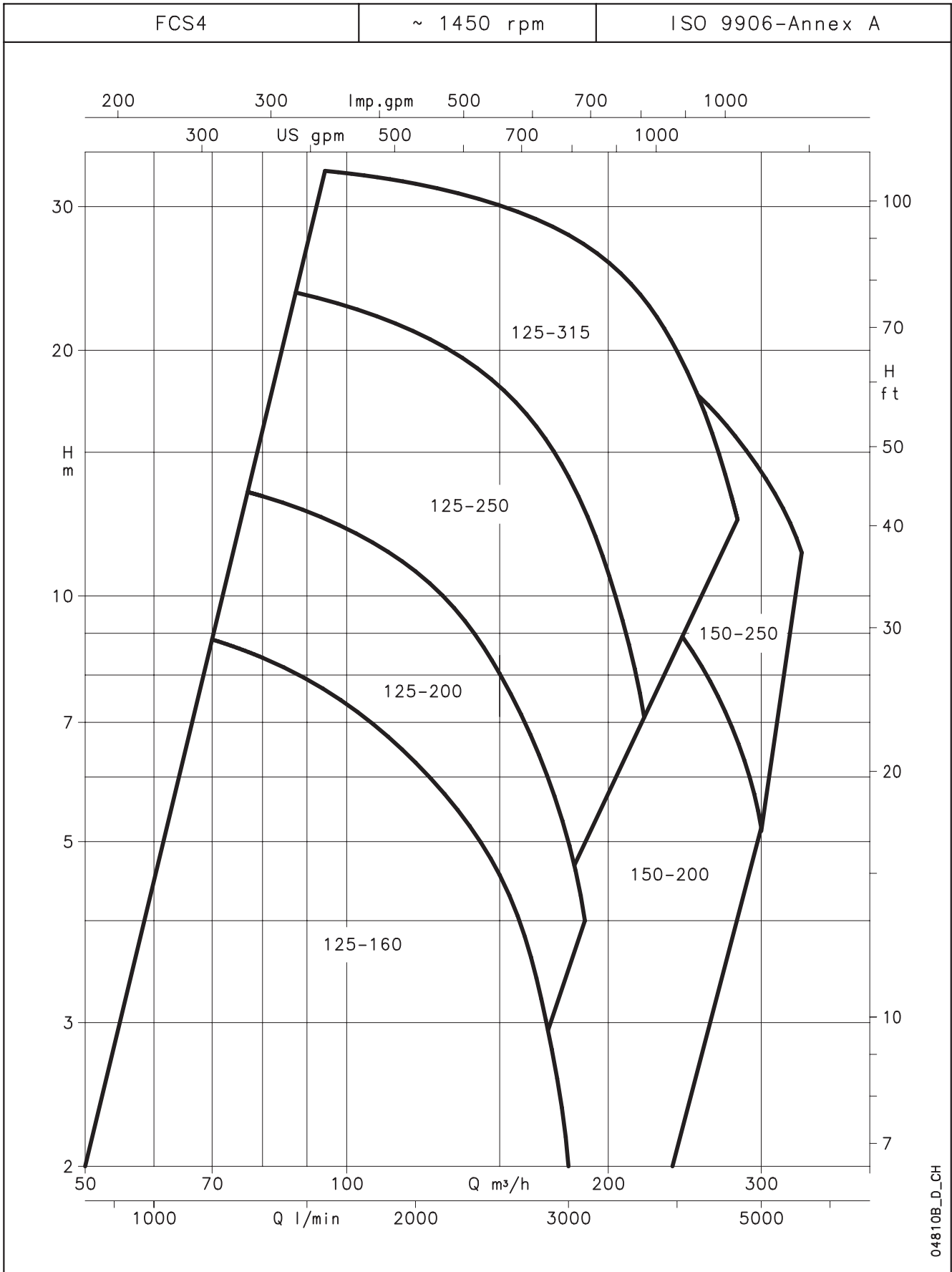
PUMP TYPE	RATED POWER		Q = DELIVERY																						
			l/min	50	100	150	175	200	300	350	400	500	600	650	750	900	1100	1200	1500	1800	2000	2500			
	kW	HP	m ³ /h	0	3	6	9	10,5	12	18	21	24	30	36	39	45	54	66	72	90	108	120	150		
H = TOTAL HEAD METRES COLUMN OF WATER																									
40-125/02A *	0,25	0,33	4,7	4,3	3,6	2,4	1,6																		
40-125/02 *	0,25	0,33	5,8	5,3	4,5	3,3	2,6																		
40-160/02 *	0,25	0,33	7,1	6,4	5,5	4,3	3,6	2,6																	
40-160/03 *	0,37	0,5	8,8	8,1	7,2	6	5,2	4,4																	
40-200/05	0,55	0,75	12,4	11,4	10	8,2	7																		
40-200/07	0,75	1	15	13,8	12,2	10,3	9,1	8																	
40-250/11	1,1	1,5	18,5	17,5	15,7	13,8	12,8	11,5																	
40-250/15	1,5	2	21	19,5	18,2	16,4	15,4	14,3																	
50-125/02 *	0,25	0,33	6,2		5,5	4,9	4,6	4,3	2,8	1,8															
50-125/03 *	0,37	0,5	8		7,4	6,8	6,5	6,1	4,4	3,5	2,5														
50-160/05 *	0,55	0,75	9,4		8,8	8,2	7,9	7,5	5,8	4,9	3,9														
50-200/07	0,75	1	11,4		10,5	9,9	9,6	9,1	7,1	5,7	3,7														
50-200/11	1,1	1,5	13,6		12,6	12	11,7	11,1	9,2	7,8	6														
50-250/15	1,5	2	17		15,9	15,2	14,8	14,4	12,6	11,4	10	7													
50-250/22	2,2	3	20,2		19	18,2	17,8	17,4	15,5	14,3	13	10													
65-125/03 *	0,37	0,5	5,6					4,9	4,3	3,9	3,5	2,6	1,6												
65-125/05 *	0,55	0,75	6,7					5,9	5,4	5,1	4,7	3,8	2,8	2,2											
65-160/07	0,75	1	8,6					7,8	7,2	6,8	6,4	5,4	4,3	3,7	2,4										
65-160/11	1,1	1,5	10,4					9,6	9	9	8,2	7,2	5,9	5,3	3,8										
65-200/15	1,5	2	14,7					13,2	12,2	11,7	11	9,7	8	7	4,2										
65-250/22	2,2	3	19					17,6	16,5	16	15,4	14	12,7	12	10	6,5									
65-250/30	3	4	21,5					20,1	19,2	18,7	18	16,6	15	14,3	12,7	9,4									
80-125/07	0,75	1	5,6					5,2	5,1	4,9	4,6	4,3	4	3,6	2,8	1,6									
80-125/11	1,1	1,5	6,8					6,4	6,3	6,2	6	5,6	5,4	5,1	4,3	3,2	2,5								
80-200/15	1,5	2	10,5					9,6	9,4	9,2	8,7	8,1	7,9	7,1	5,8	3,3									
80-200/22	2,2	3	13,7					12,7	12,6	12,3	11,8	11,3	11	10,2	8,9	6,8	5,5								
80-200/30	3	4	15,8					14,7	14,5	14,3	13,8	13,2	13	12,3	11,2	9,3	8								
80-250/40	4	5,5	19,9					18,7	18,5	18,2	17,7	17	16,7	16	14,6	12,5	11,2								
80-250/55	5,5	7,5	23,2					22	21,8	21,5	21	20,3	20	19,2	18	16	14,8	10,4							
100-160/15	1,5	2	7,8									7,4	7,2	7,1	6,9	6,6	5,9	5,6	4,5	3					
100-200/22	2,2	3	10,5										9,3	9,2	8,9	8,3	7,5	7	5,4	3,5	2				
100-200/30	3	4	12,8										11,5	11,3	11	10,6	9,8	9,3	7,8	5,8	4,2				
100-250/40	4	5,5	17										15,5	15,3	15	14,3	13,3	12,8	11,1	9,2	7,8				
100-250/55	5,5	7,5	20,5										19	18,8	18,5	17,8	17	16,5	14,9	13,1	11,8	8			
100-250/75	7,5	10	24										22,5	22,3	22	21,5	20,7	20,3	18,9	17,1	15,8	11,8			

* FCE4 VERSION ONLY

fce4-fcs4-4p50_d_th

Performances according to ISO 9906 - Annex A.

**FCS4 SERIES
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 4 POLES**



The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

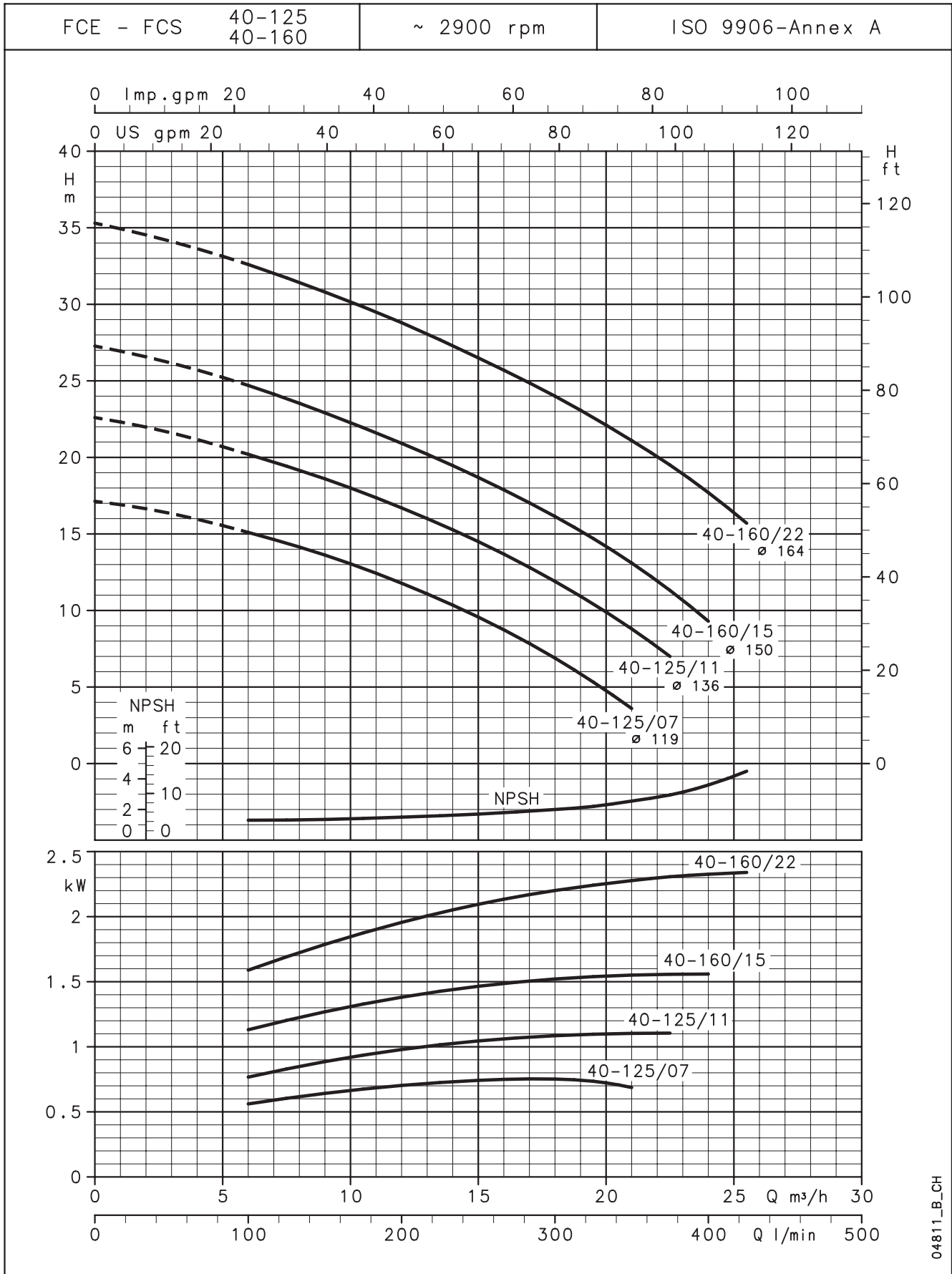
FCS4 SERIES HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 4 POLES

PUMP TYPE	RATED POWER		Q = DELIVERY																	
			l/min	1000	1083	1167	1333	1500	1667	2000	2333	2667	3000	3333	3667	4167	4667	5000	5333	5500
			m ³ /h	60	65	70	80	90	100	120	140	160	180	200	220	250	280	300	320	330
kW		HP	H = TOTAL HEAD METRES COLUMN OF WATER																	
125-160/30	3	4	10,5	9,3	9,1	8,8	8,4	7,8	7,3	6,3	5,2	3,8	2							
125-200/40	4	5,5	12,7	11,4	11,2	11	10,5	9,9	9,3	7,7	5,7	3,4								
125-200/55	5,5	7,5	15,1	14,2	13,9	13,7	13,3	12,7	12,2	10,7	9	7	4,9							
125-250/75	7,5	10	20,5	19	18,8	18,6	18	17,3	16,6	14,8	12,3	9,7	6,8							
125-250/110	11	15	26,1	24,8	24,6	24,4	24	23,4	22,8	21,1	19	16,8	14	10,8	7					
125-315/150	15	20	27	26	25,9	25,8	25,4	25	24,6	23,6	22,2	20,3	18,3	16	13	7,8				
125-315/185	18,5	25	31	30	29,9	29,8	29,5	29,2	28,9	28	26,8	25	23	20,8	18	13,5	8			
125-315/220	22	30	35	34	33,9	33,8	33,5	33,2	32,9	32	31	29,5	27,8	25,5	23	18,3	13	8,9		
150-200/55	5,5	7,5	11,2	10,2	10	9,8	9,6	9,3	9	8,3	7,5	6,7	5,8	4,7	3,5					
150-200/75	7,5	10	15,6	13,8	13,7	13,6	13,4	13,1	12,8	12,1	11,4	10,5	9,6	8,4	7,2	4,8				
150-250/110	11	15	17,2			16,8	16,7	16,5	16,3	15,8	15,2	14,3	13,4	12,3	11,2	9,3	7	5,2		
150-250/150	15	20	21,1			20,7	20,6	20,5	20,4	20	19,5	18,8	18	17	16	14,2	12	10,3	8,5	
150-250/185	18,5	25	24,6			24	23,9	23,8	23,7	23,3	22,9	22,2	21,5	20,7	19,7	17,9	15,7	14,2	12,5	11,5

Performances according to ISO 9906 - Annex A.

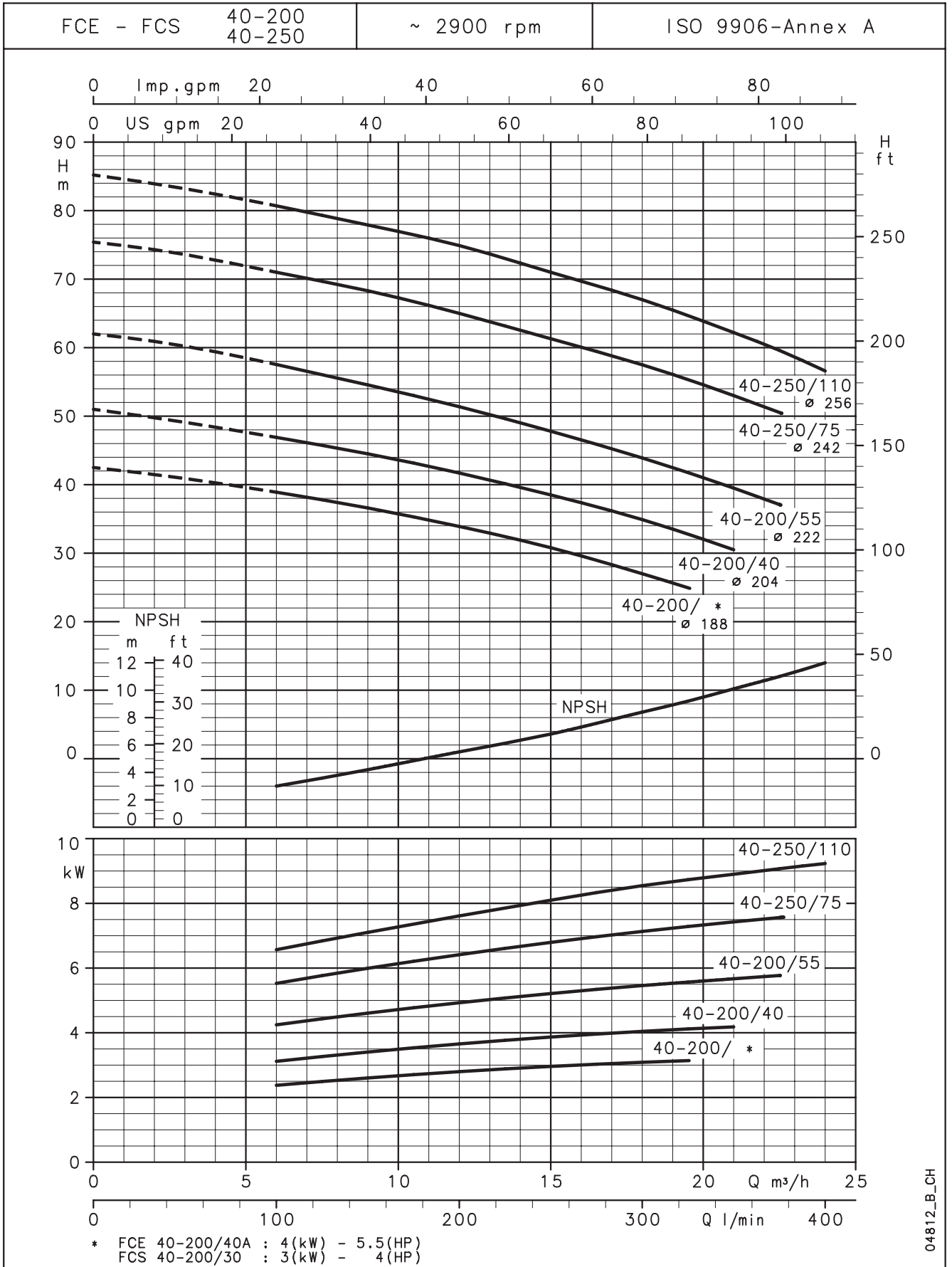
fcs4-4p50_c_th

**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



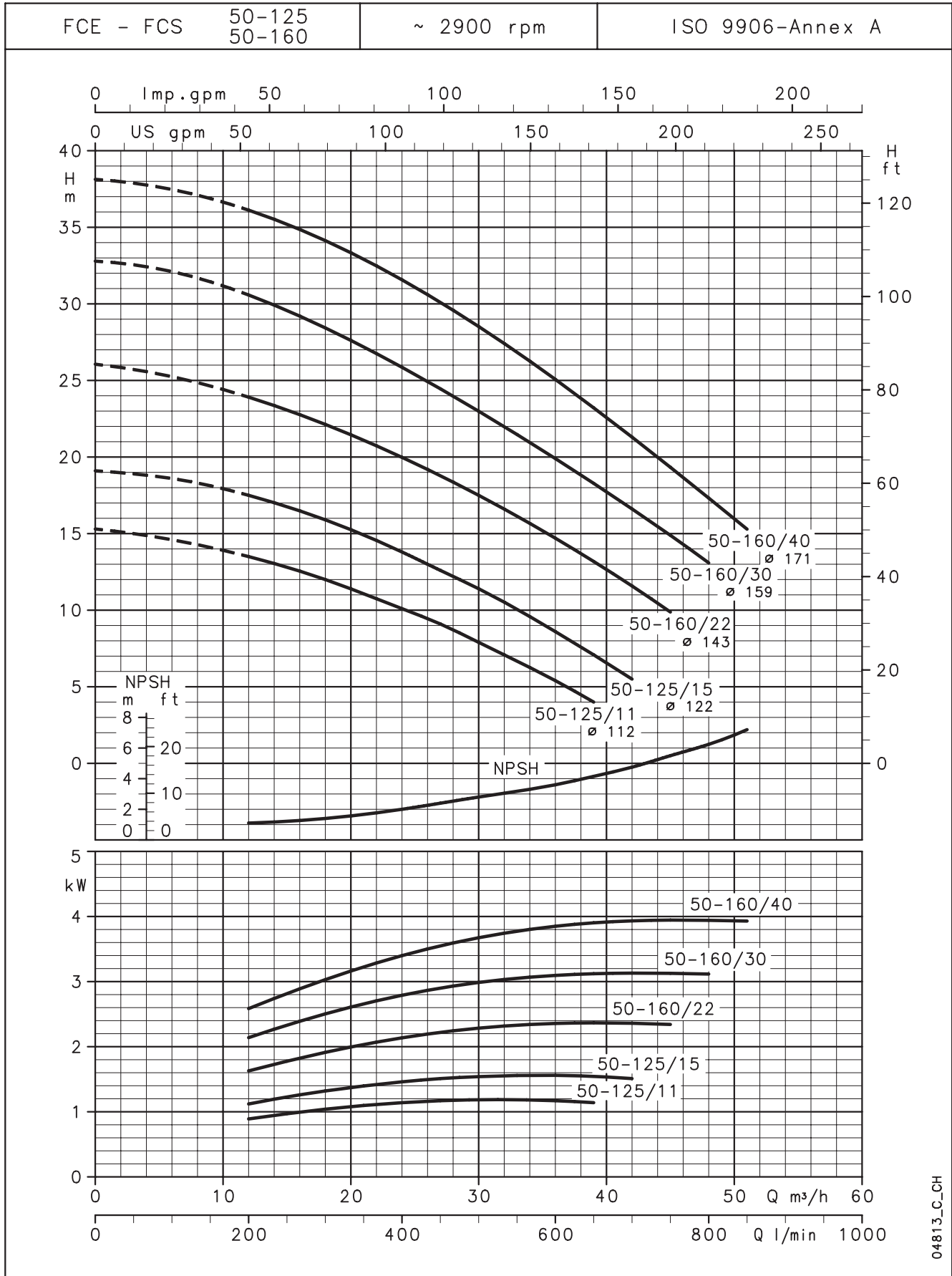
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



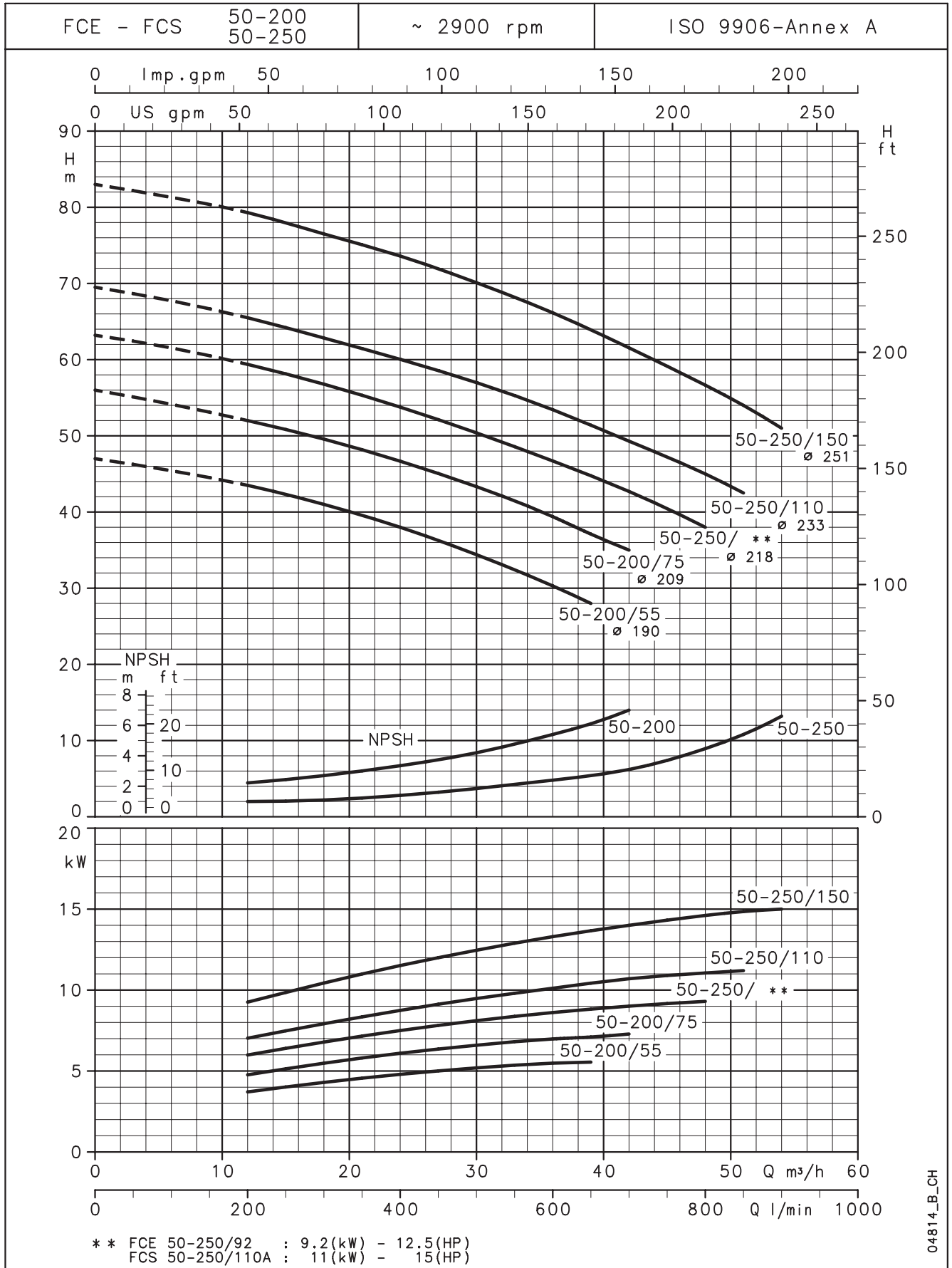
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



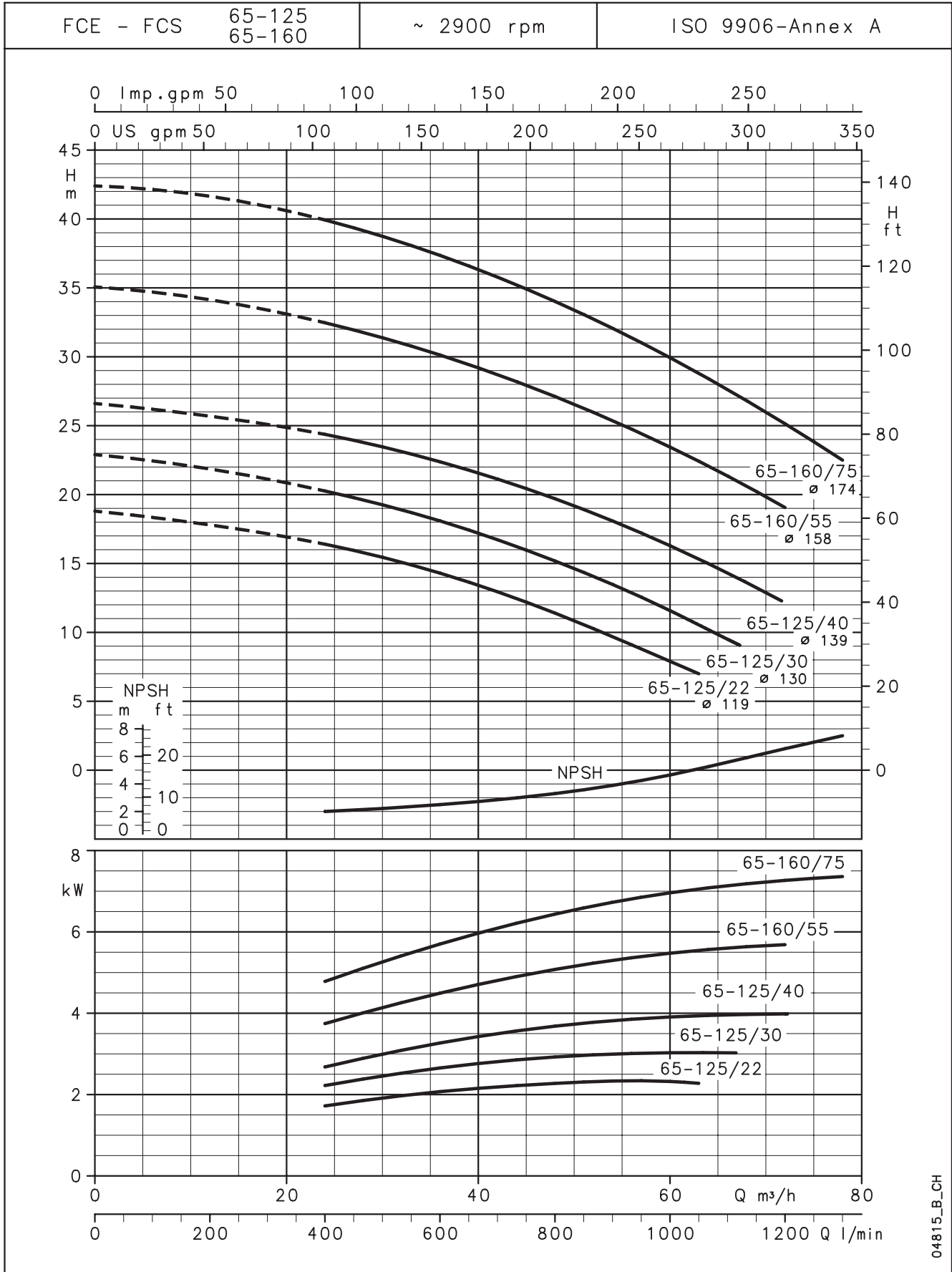
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



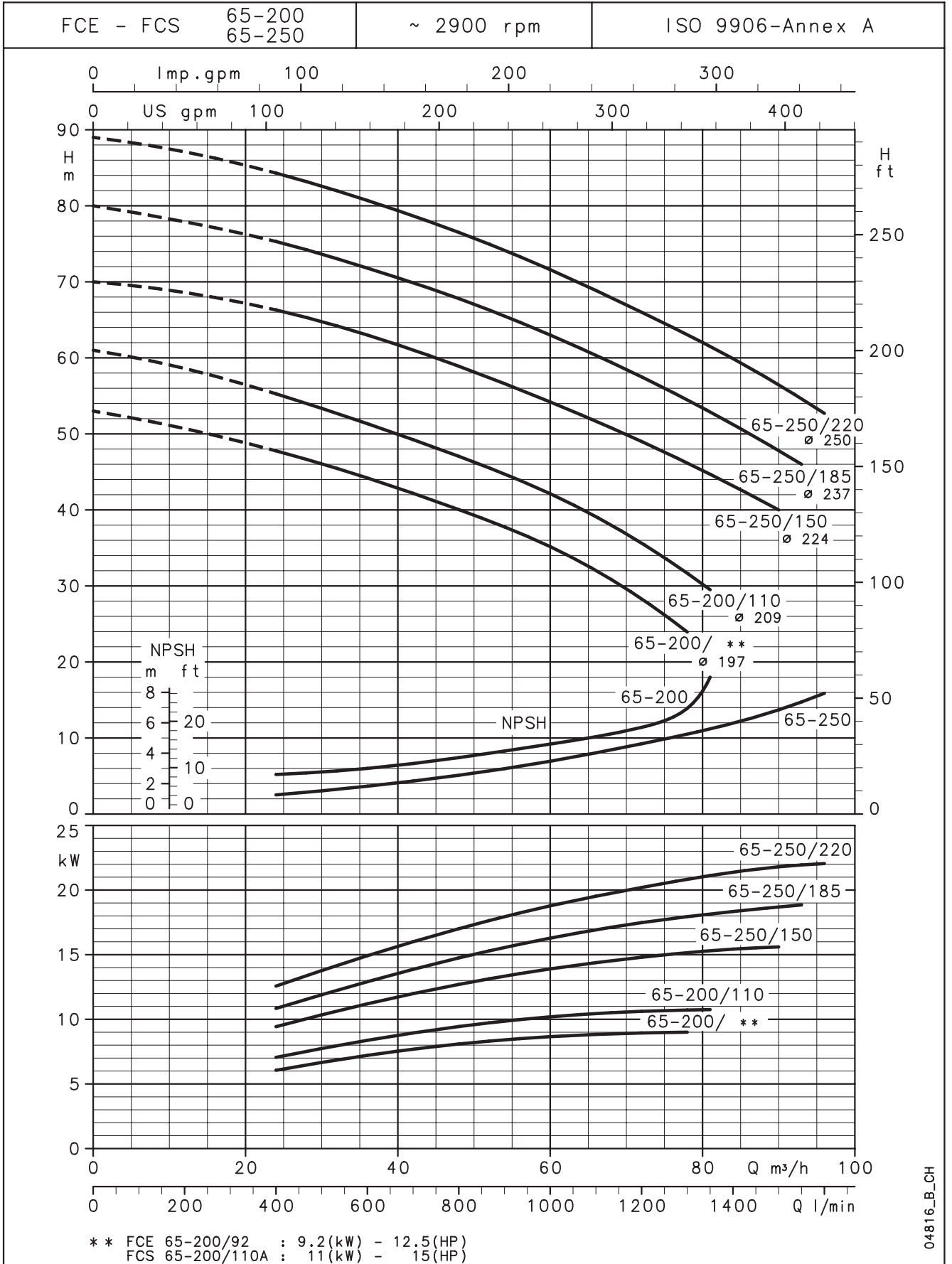
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



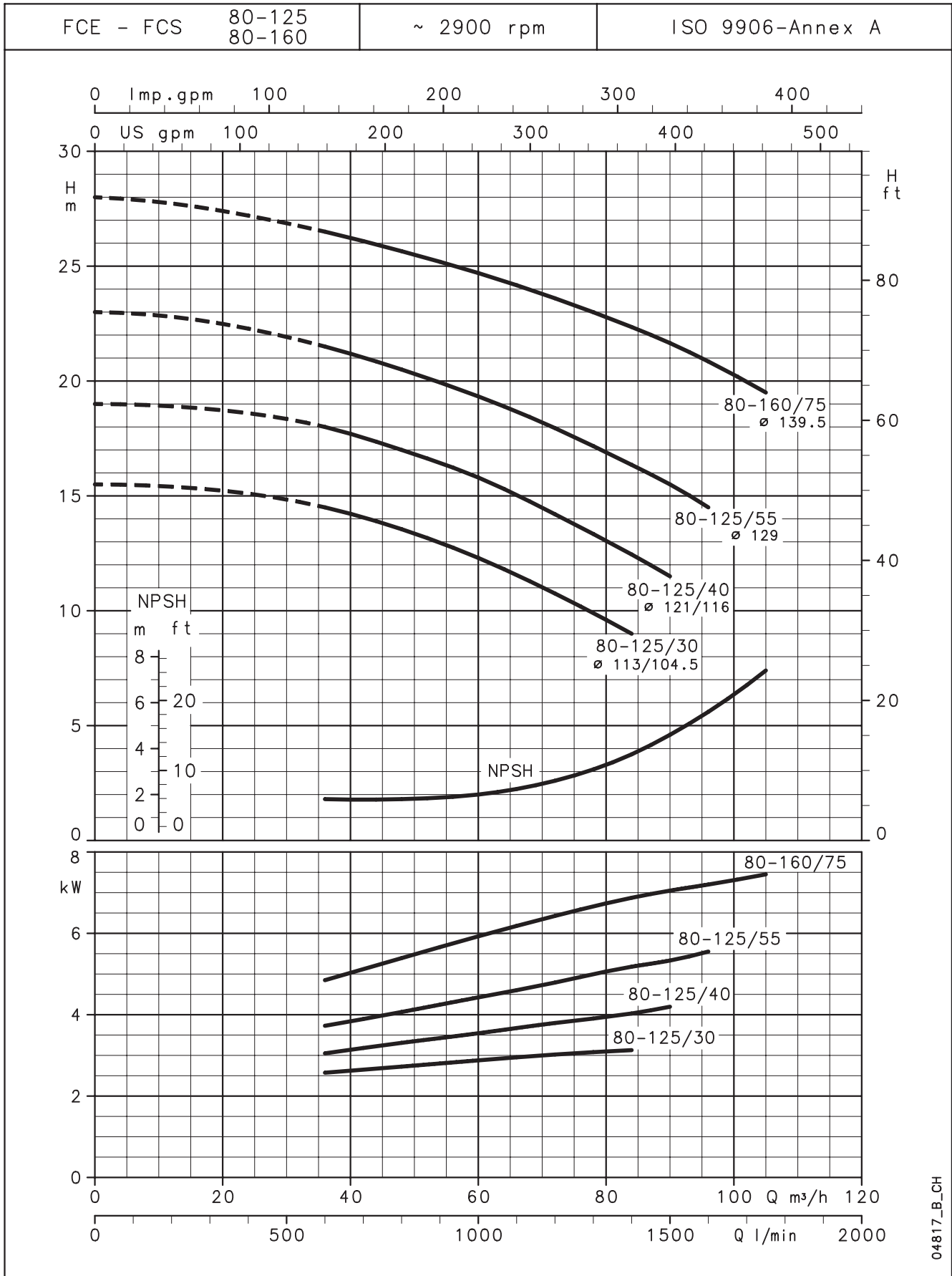
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



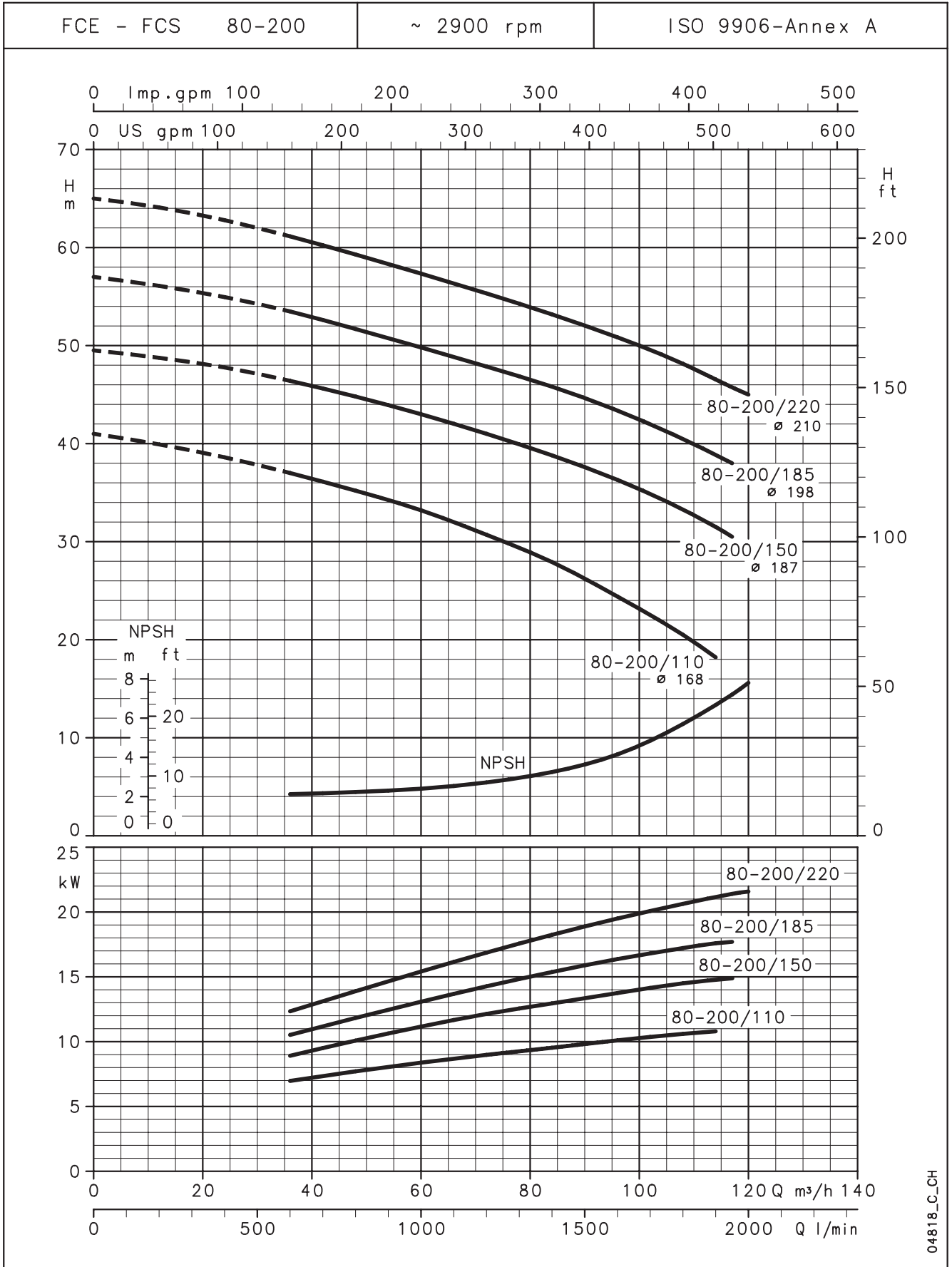
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



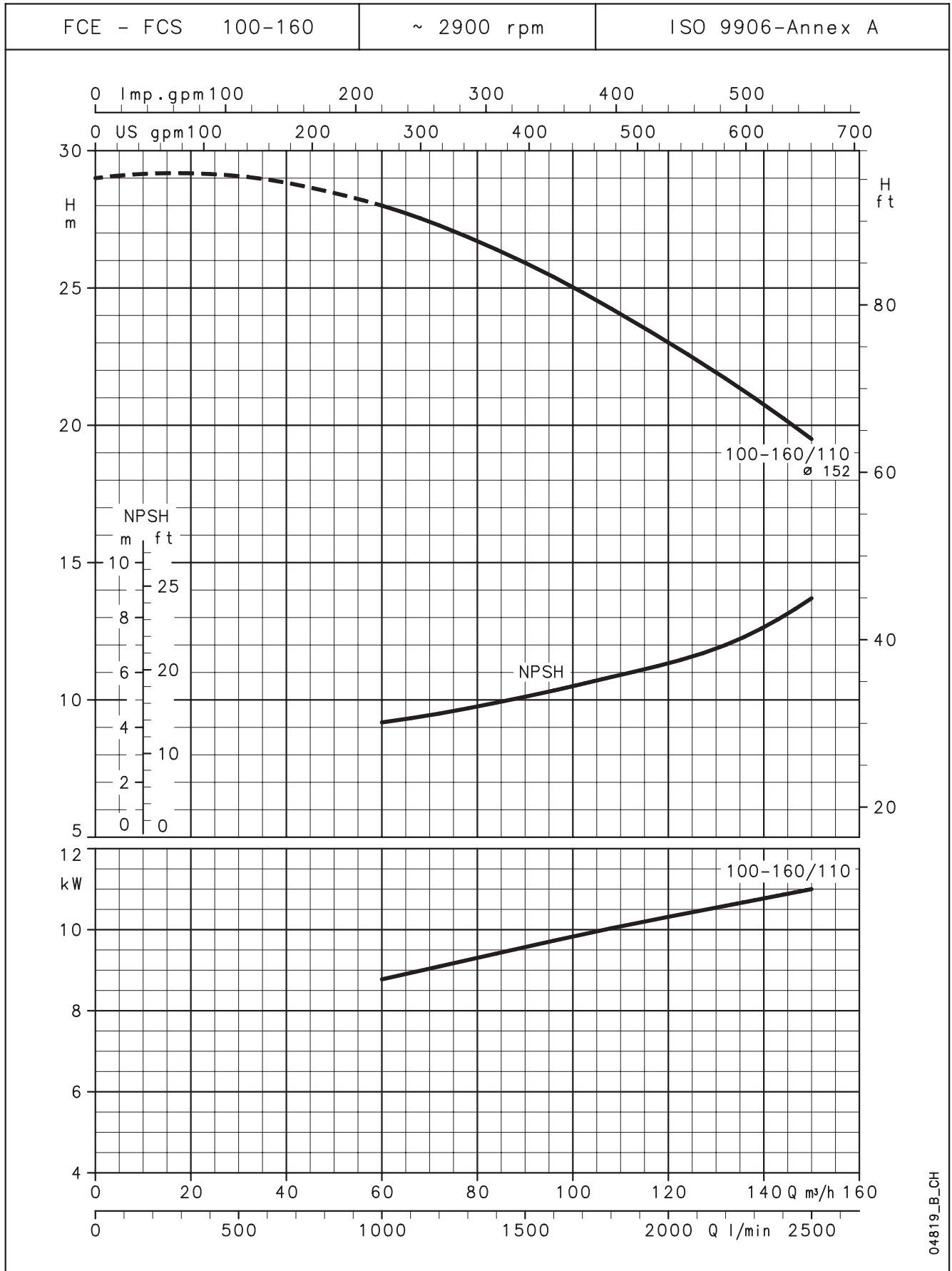
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



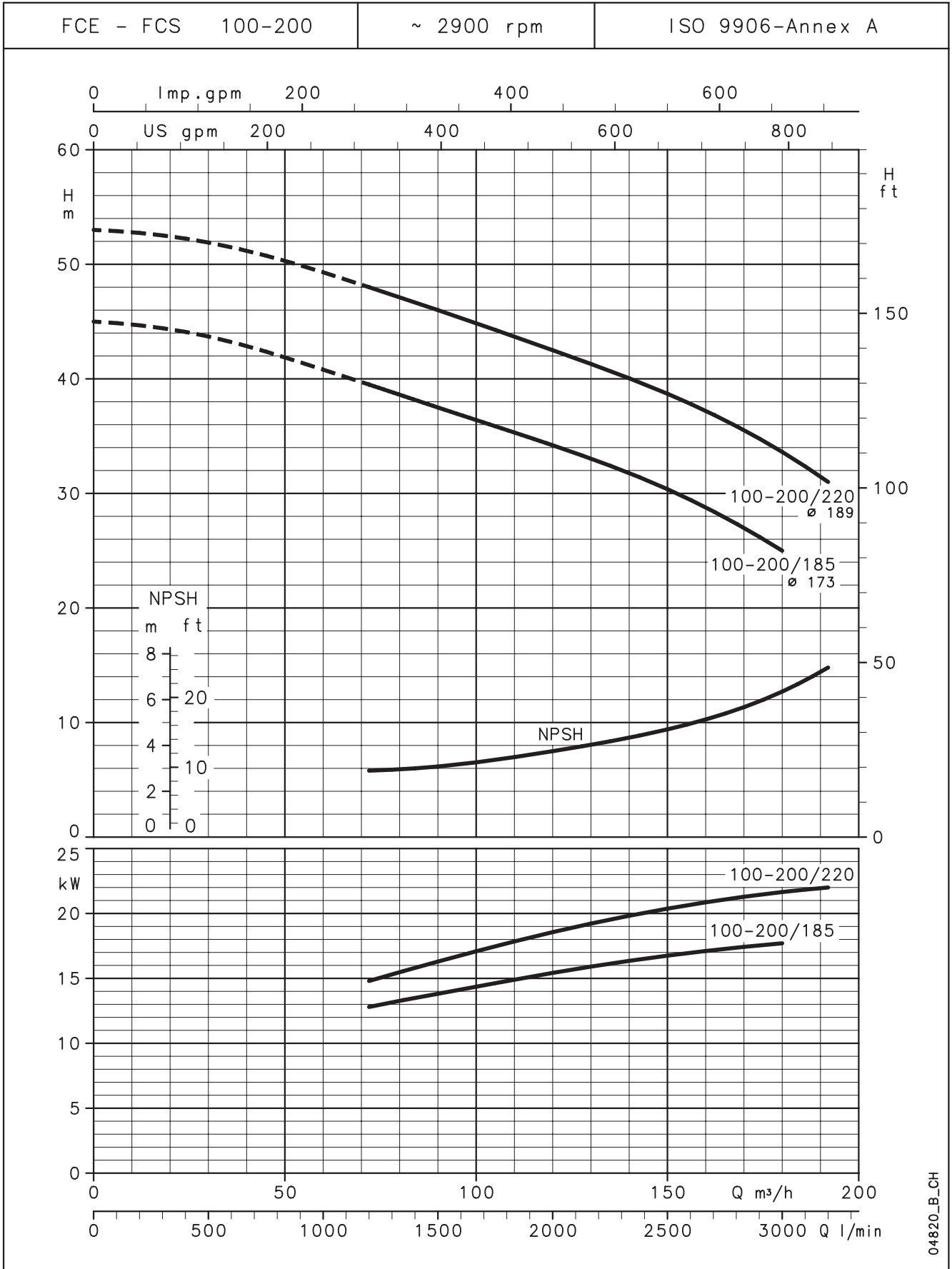
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

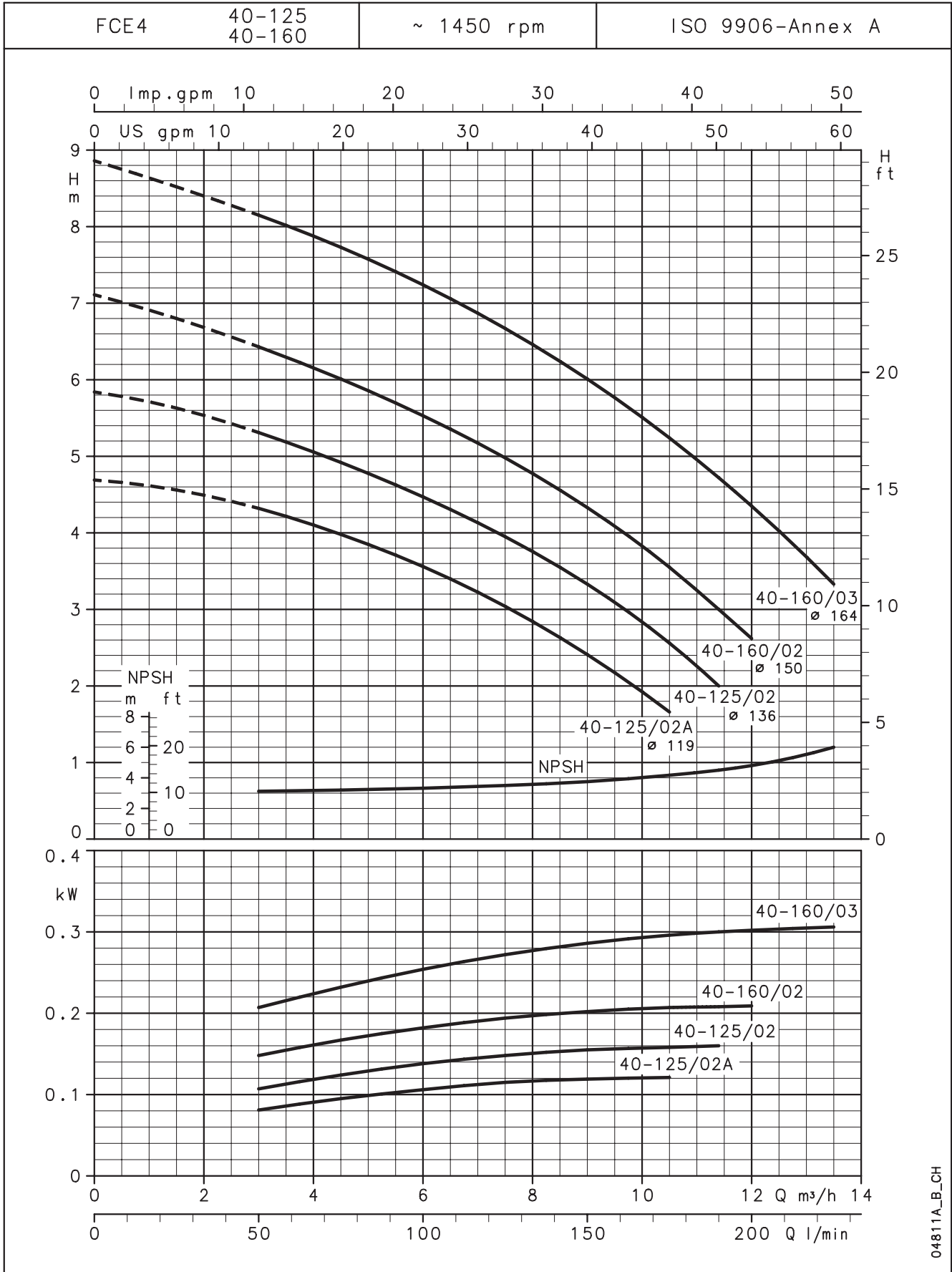
**FCE-FCS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



04820_B_CH

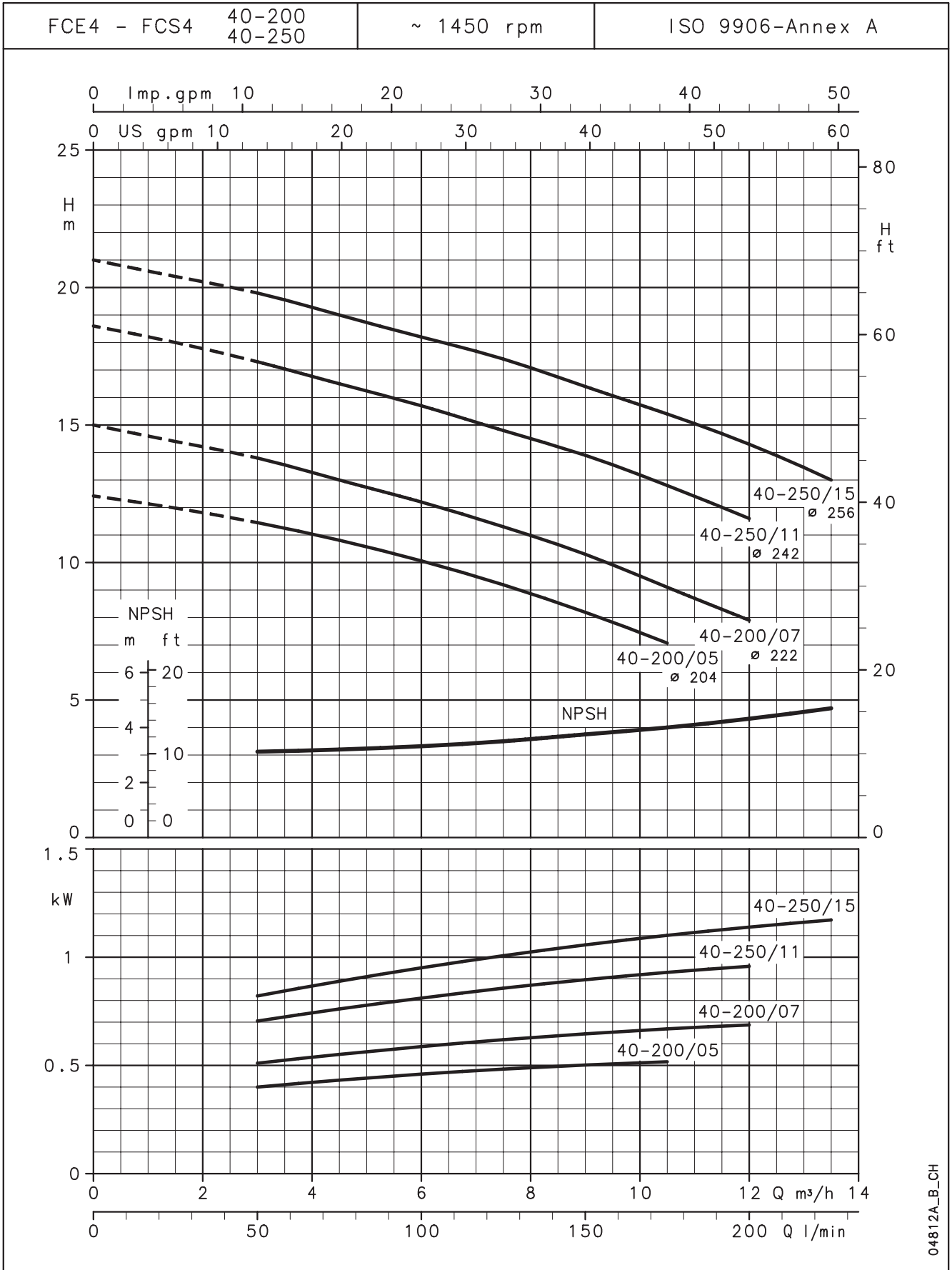
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

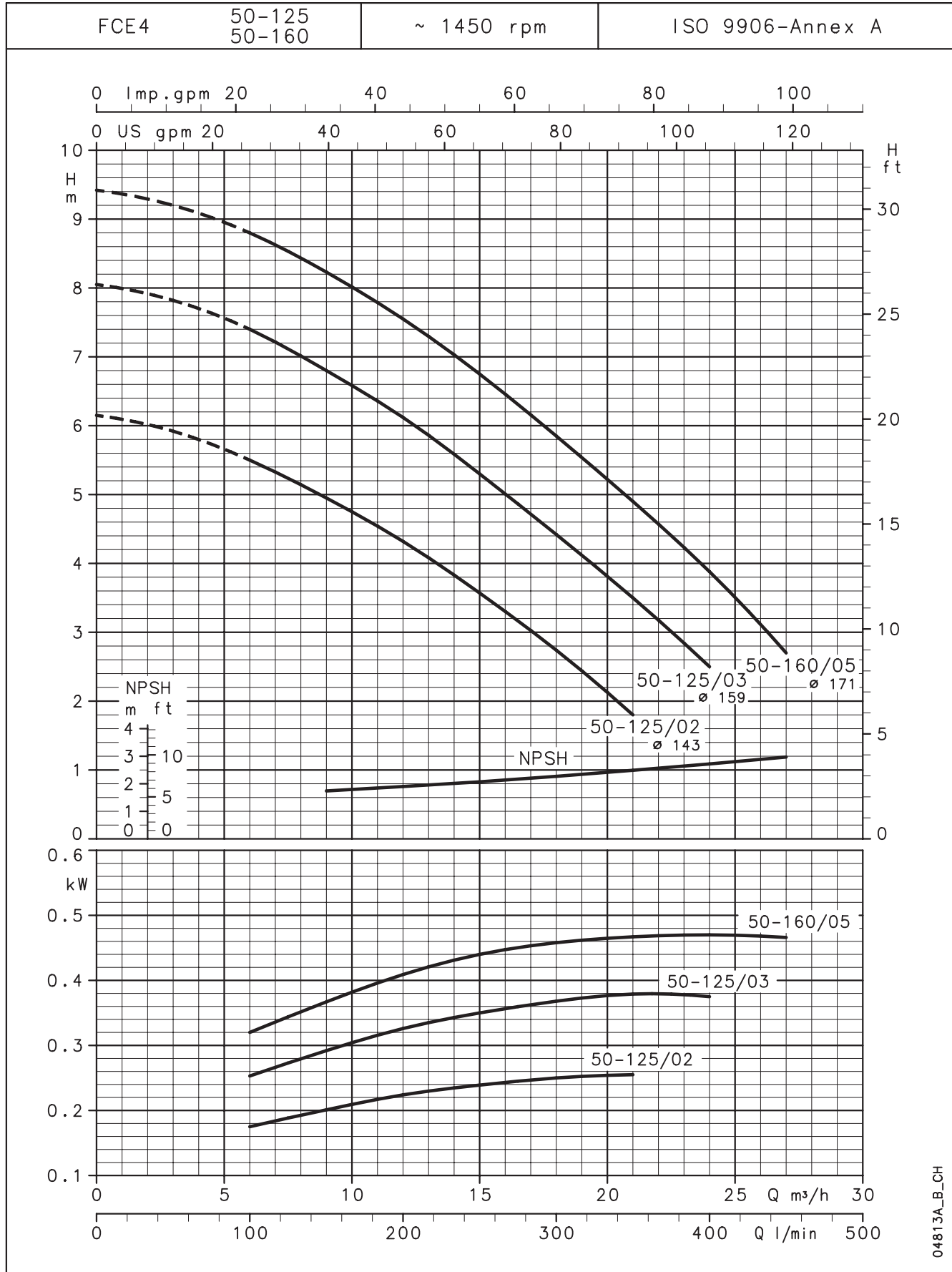
**FCE4-FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

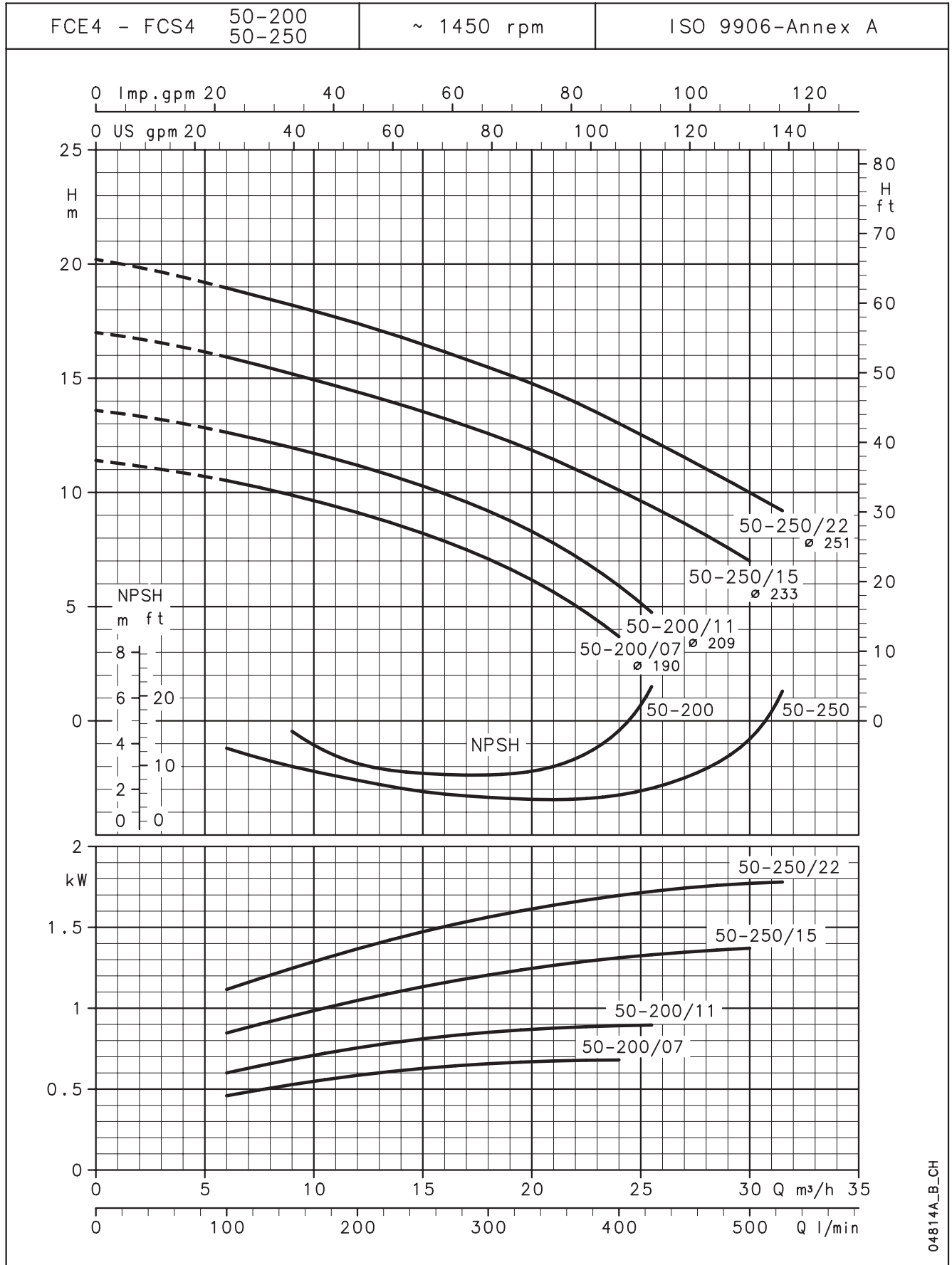
04812A_B_CH

**FCE4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

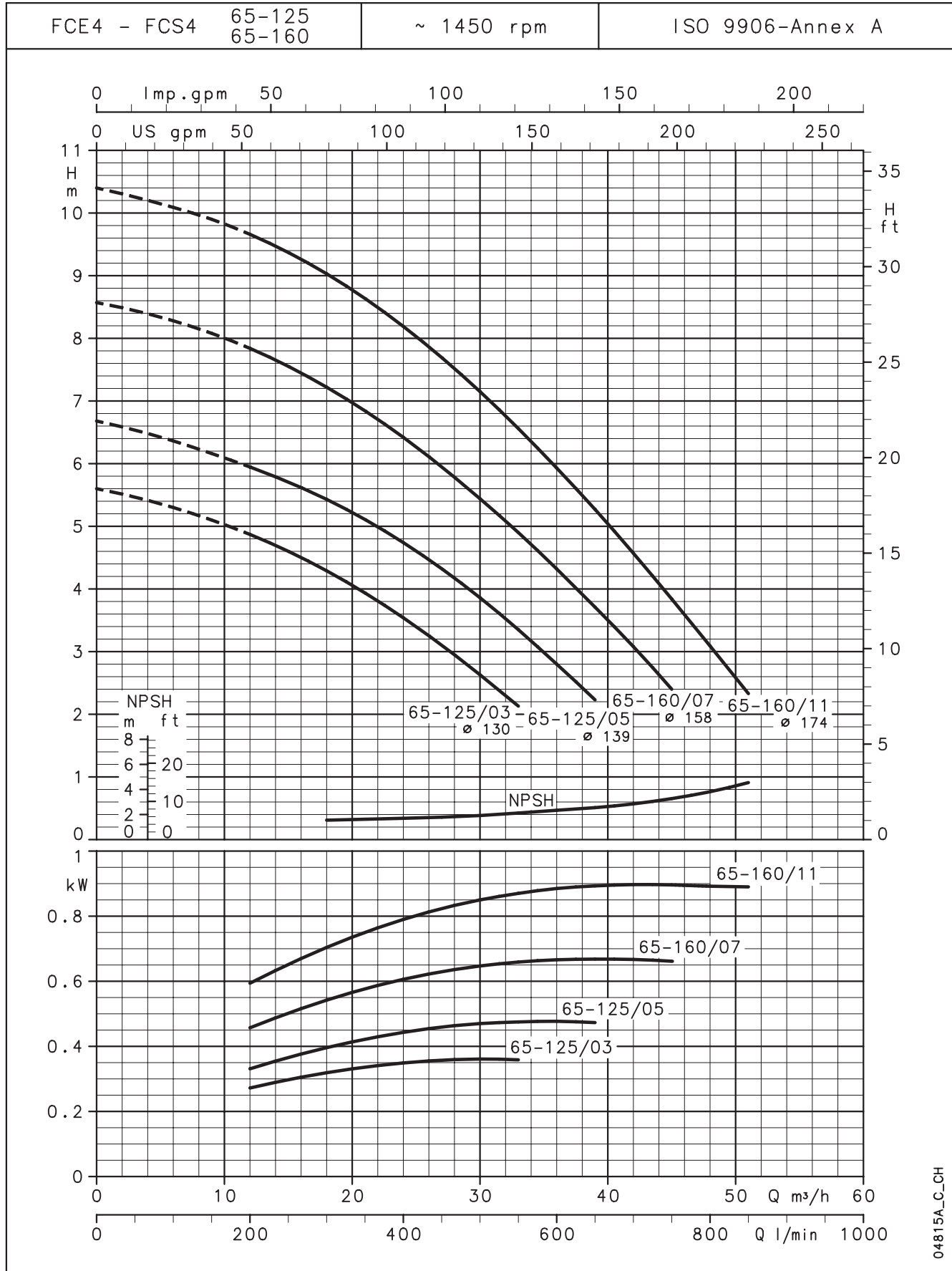
**FCE4-FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

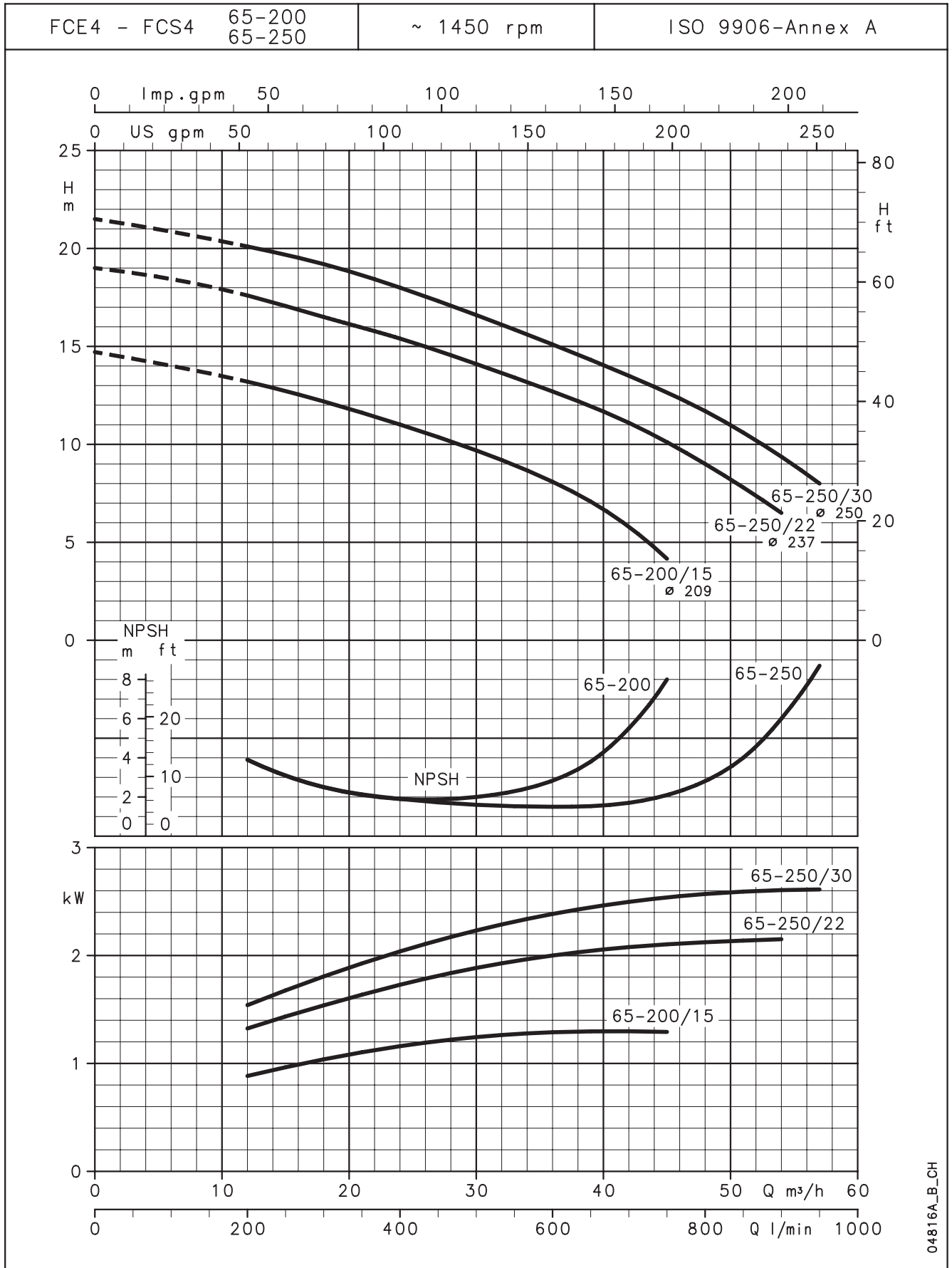
04814A_B_CH

**FCE4-FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

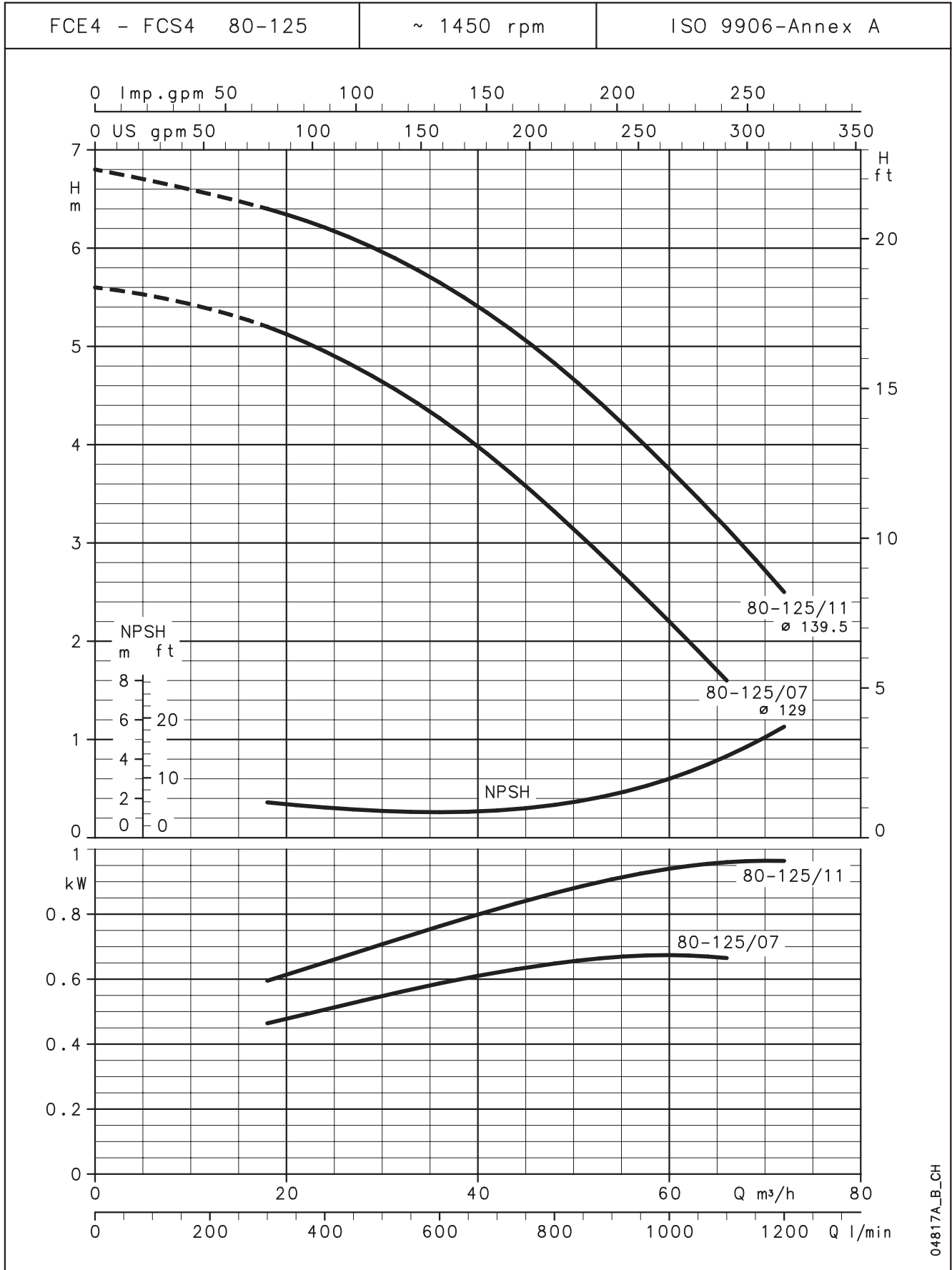
**FCE4-FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

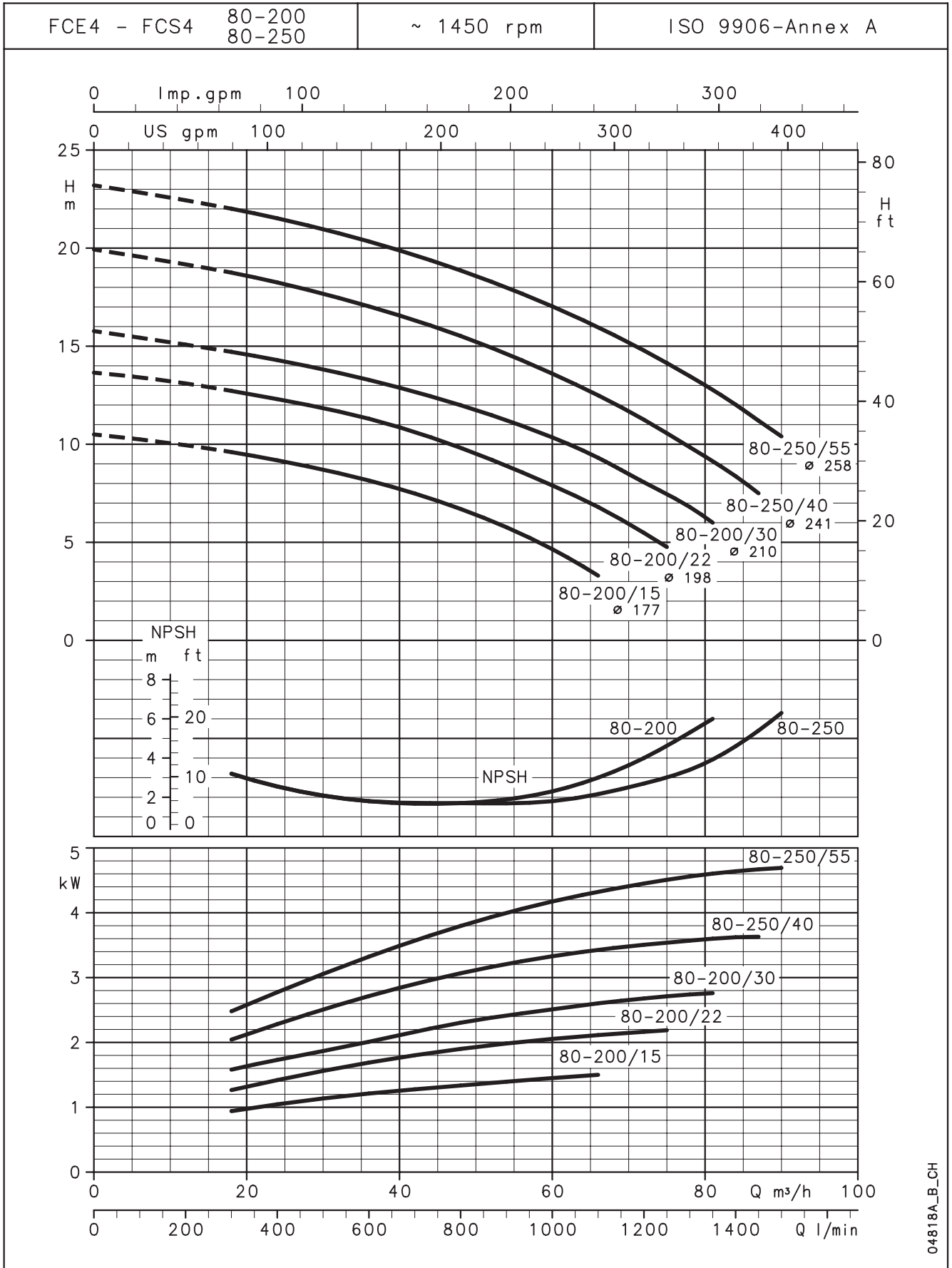
04816A_B_CH

**FCE4-FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



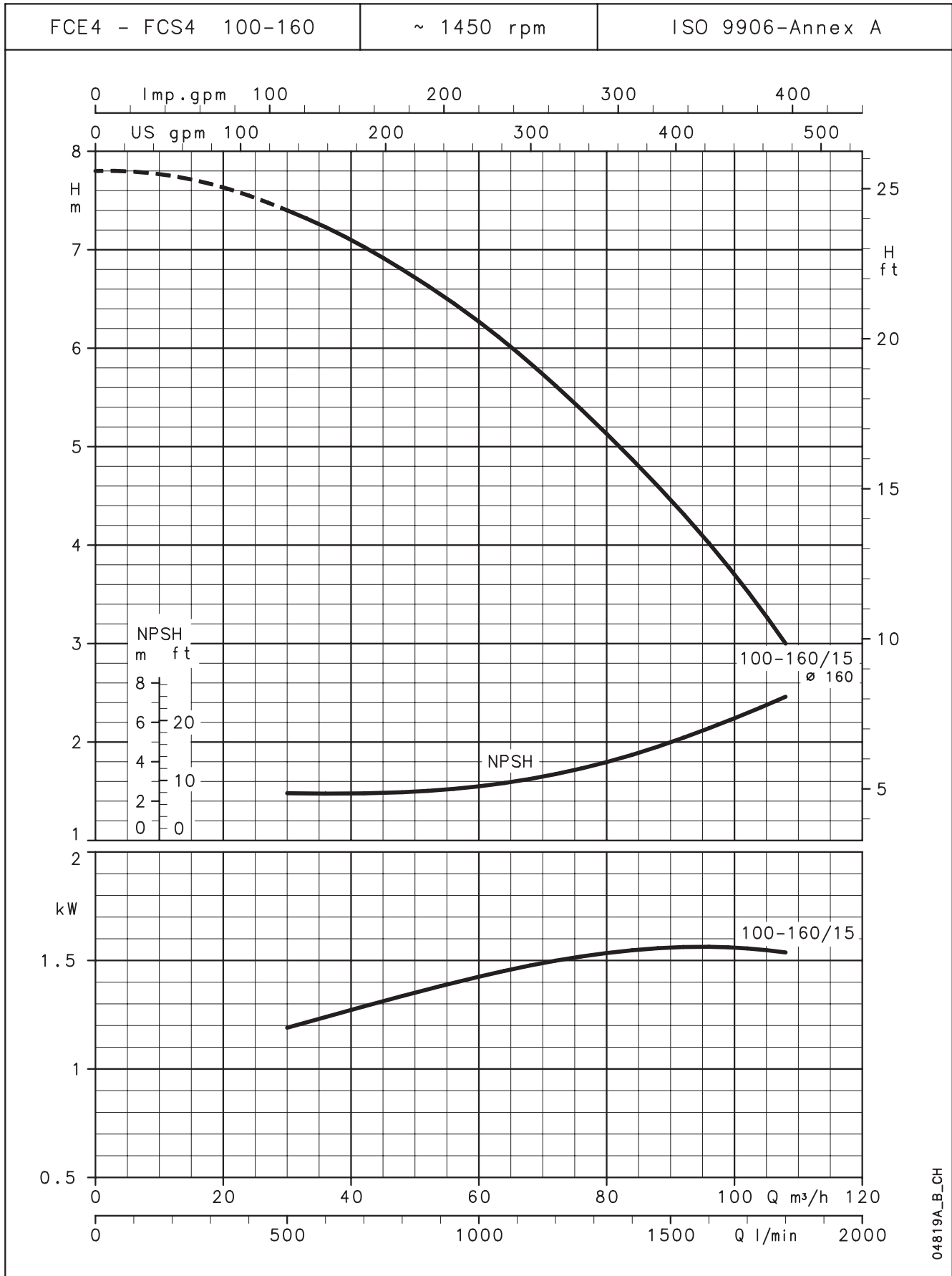
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE4-FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



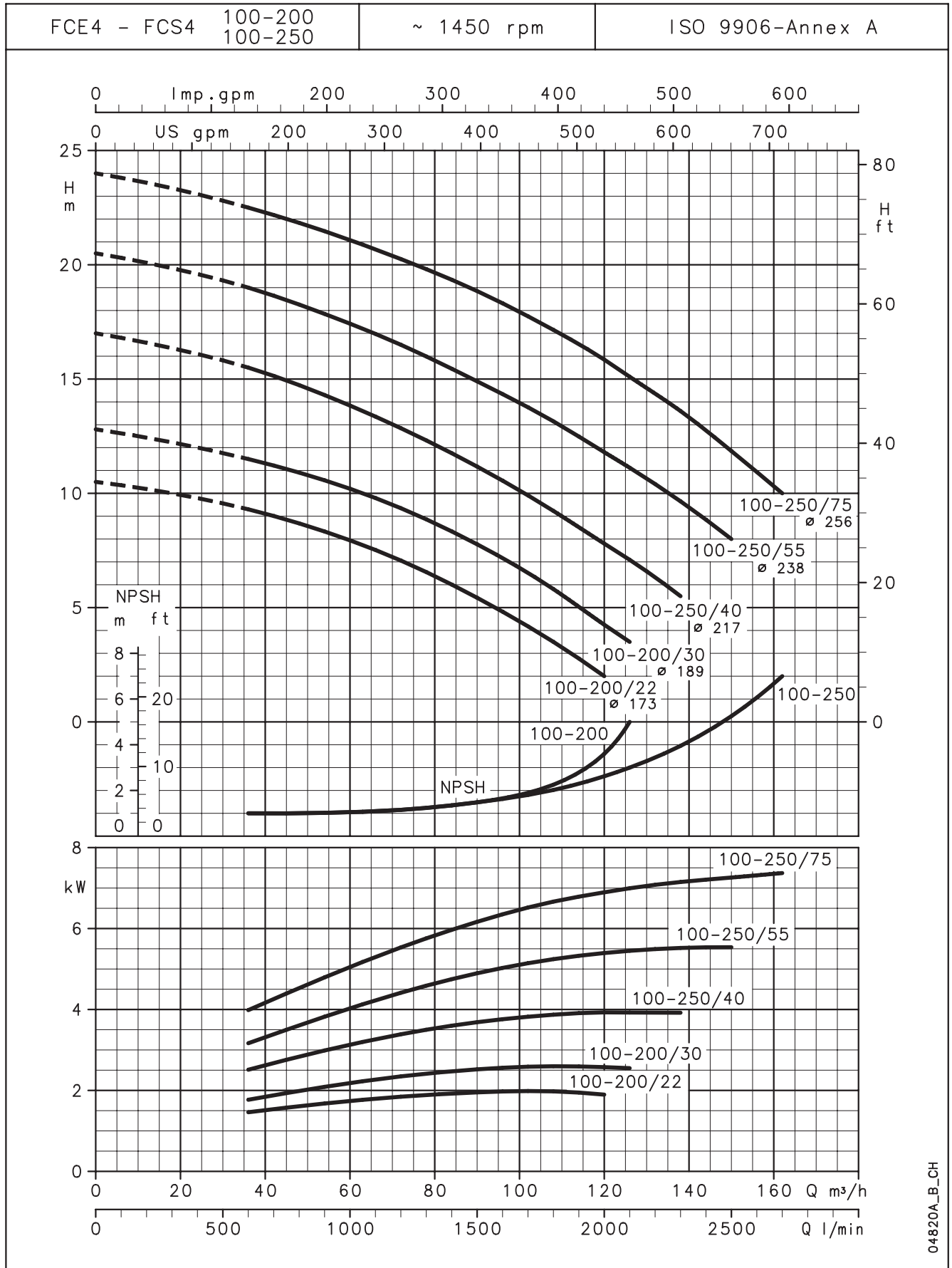
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE4-FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



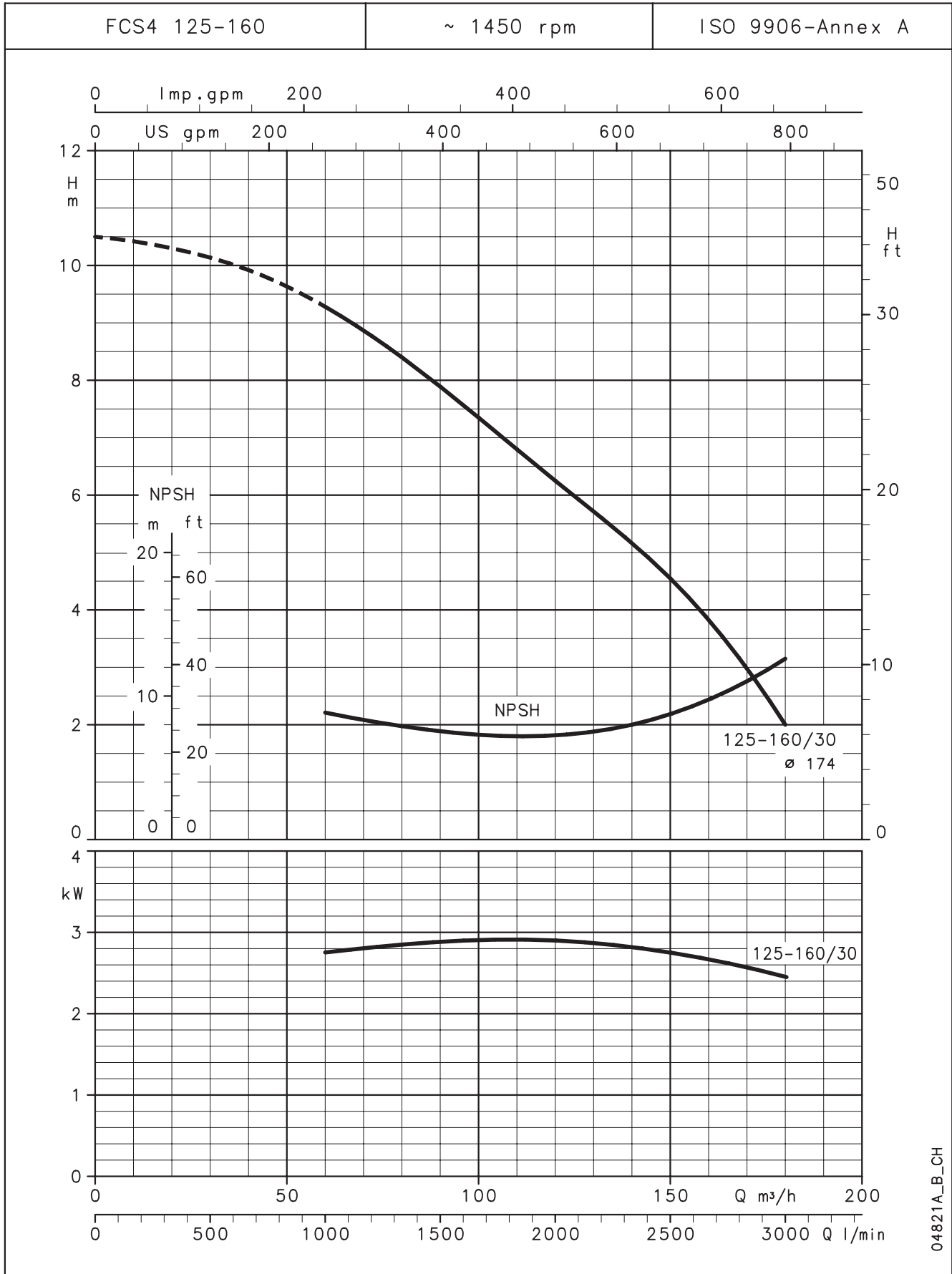
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCE4-FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



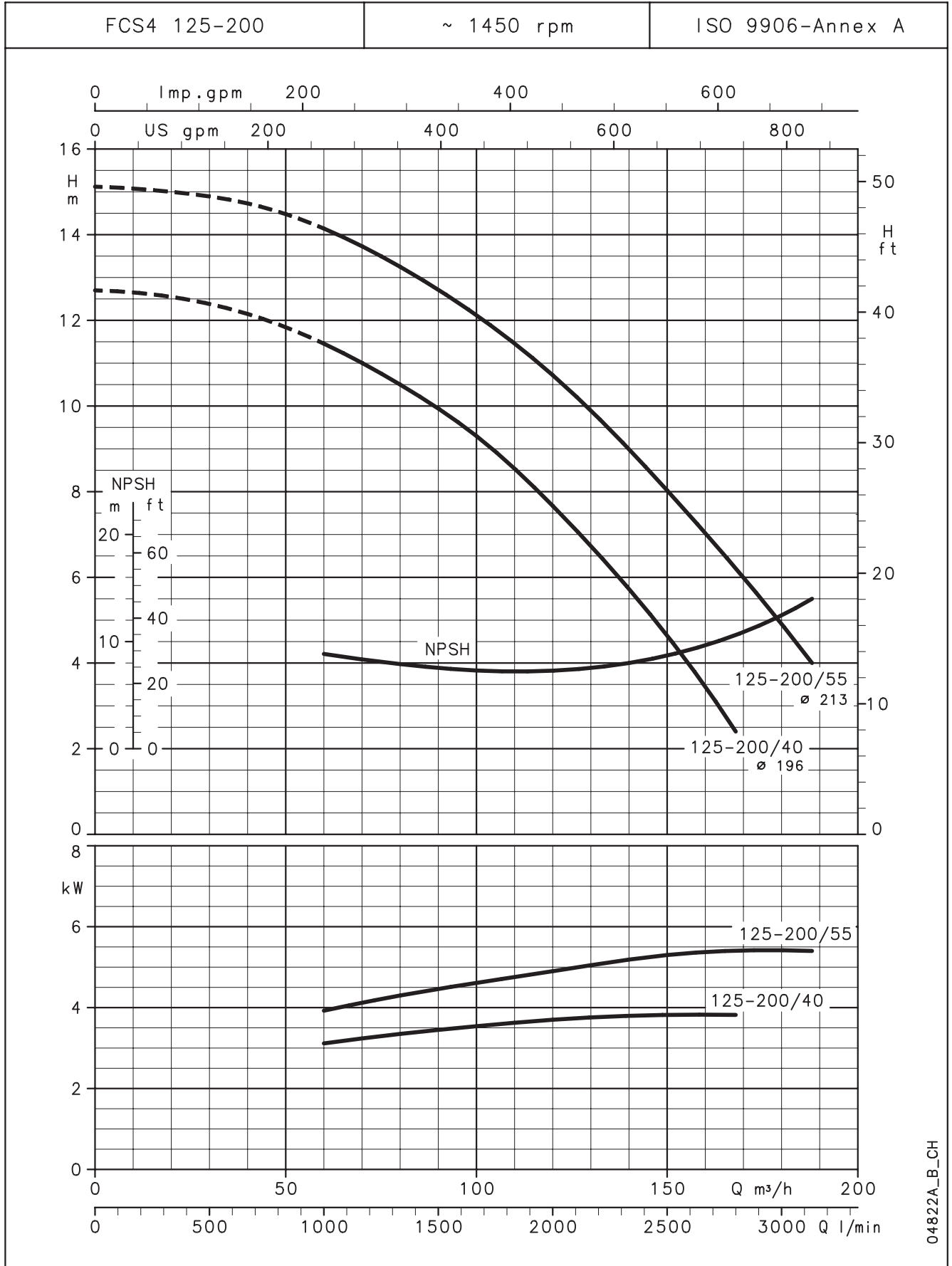
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



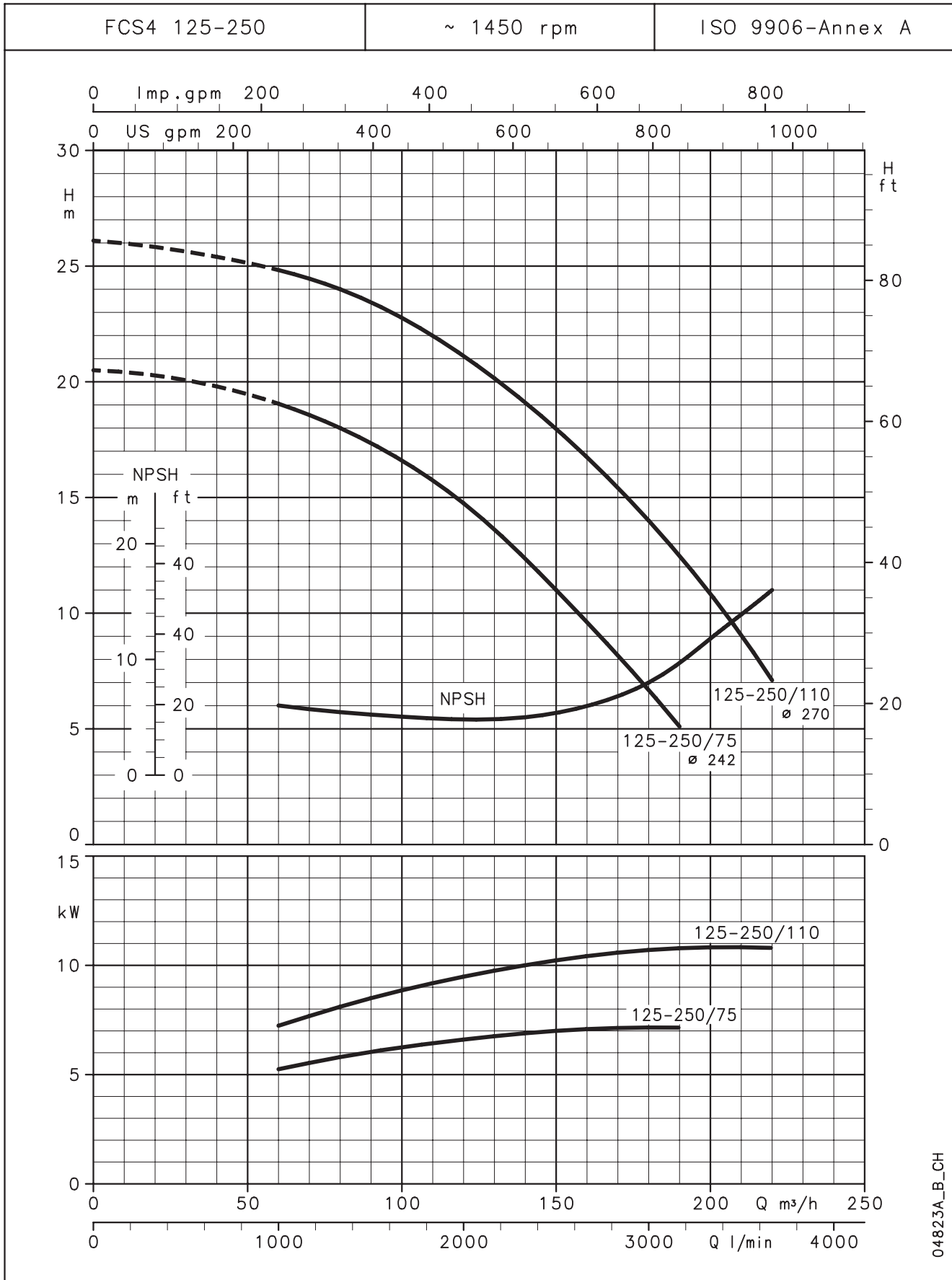
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



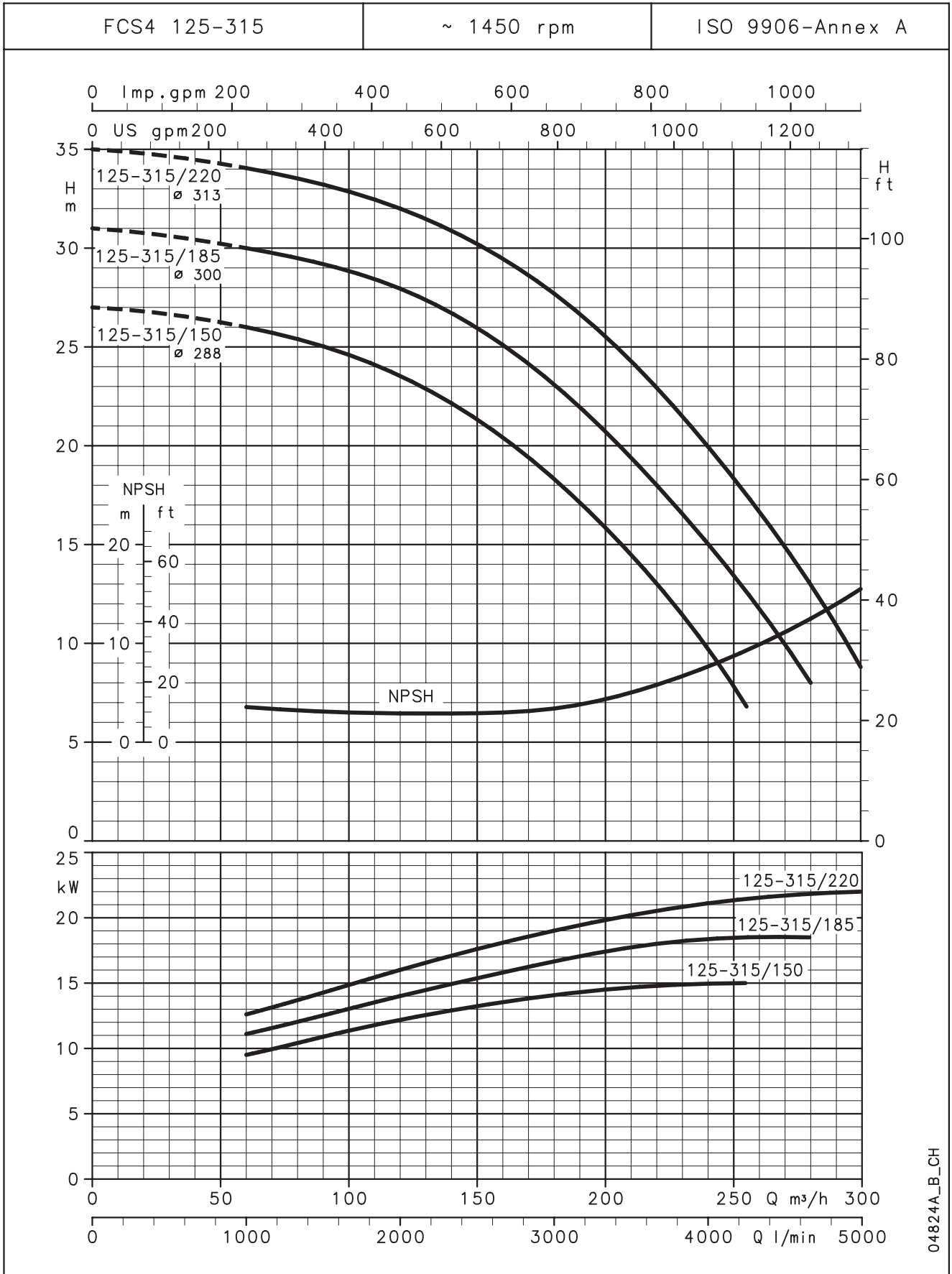
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

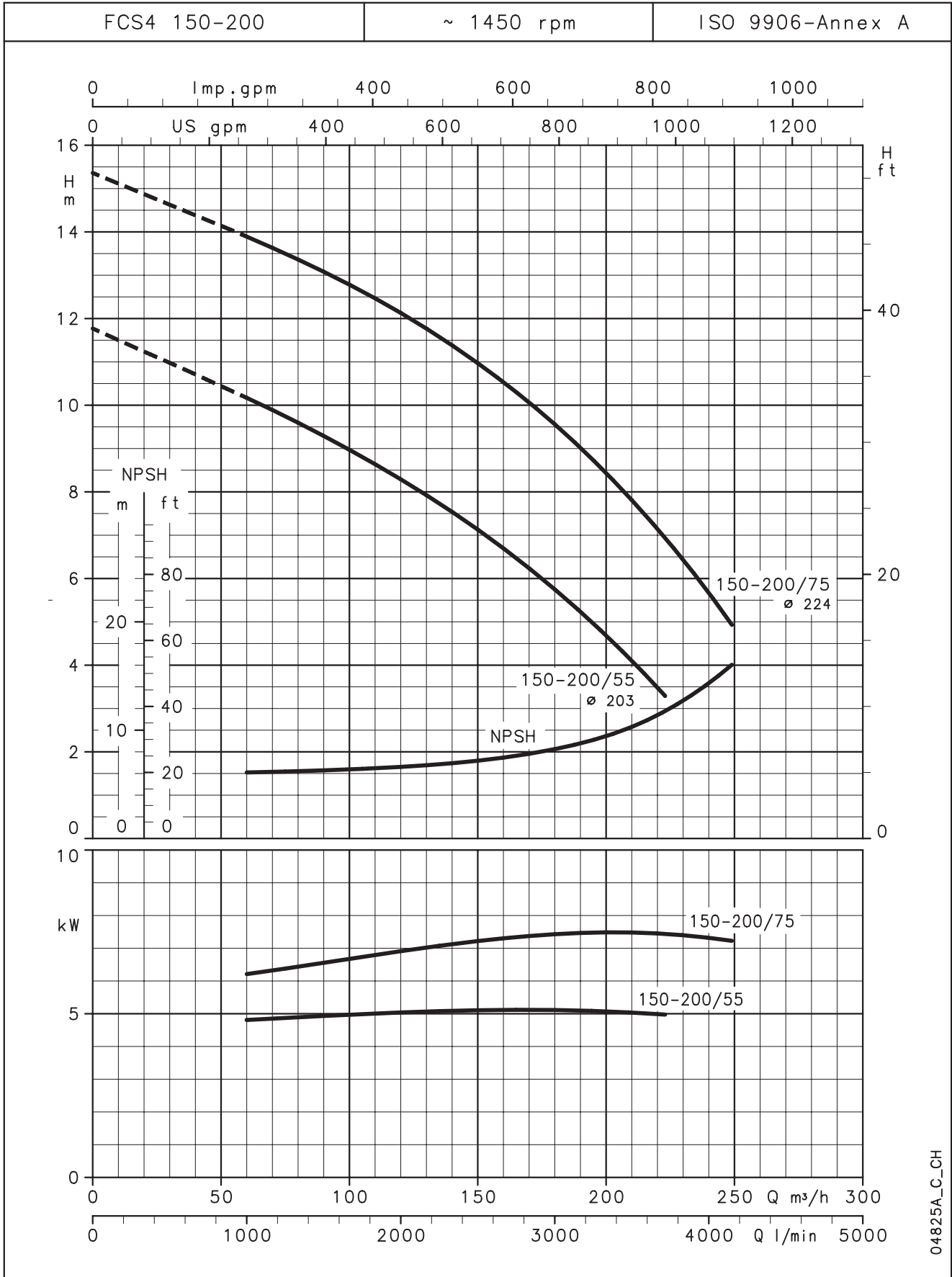
**FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



04824A_B_CH

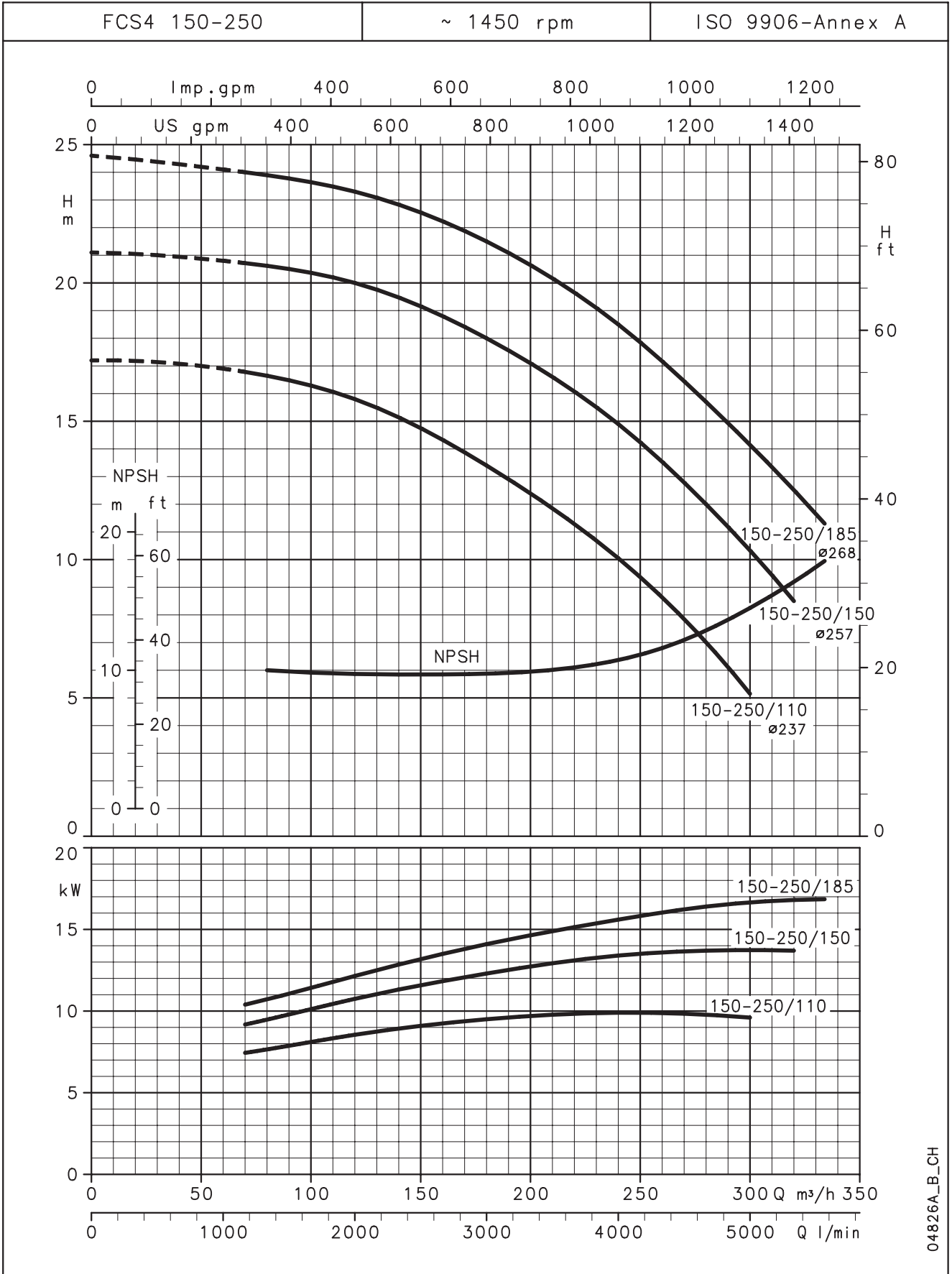
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

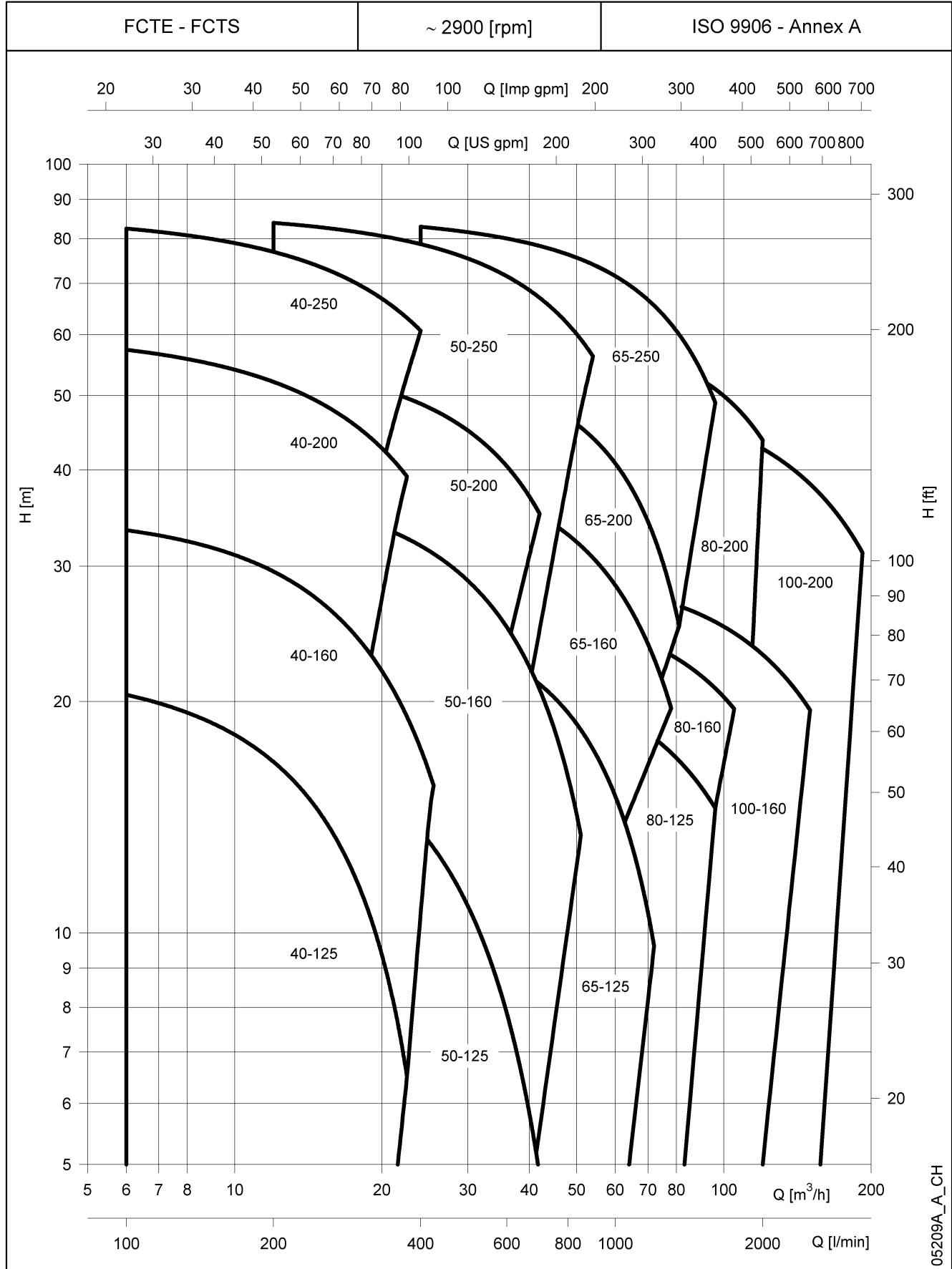
**FCS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



04826A_B_CH

The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE-FCTS SERIES (SINGLE OPERATION)
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 POLES**



The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

FCTE-FCTS SERIES (SINGLE OPERATION) HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

PUMP TYPE	RATED POWER		Q = DELIVERY																		
			l/min	100	200	300	350	400	600	700	900	1000	1200	1300	1400	1600	1750	2000	2500	3000	
			m ³ /h	6	12	18	21	24	36	42	54	60	72	78	84	96	105	120	150	180	
kW		HP	H = TOTAL HEAD METRES COLUMN OF WATER																		
40-125/07	0,75	1	17,9	16,0	12,5	7,4	4,3														
40-125/11	1,1	1,5	22,6	20,4	16,7	11,5	8,3														
40-160/15	1,5	2	28,2	26,0	22,3	17,2	14,1	10,6													
40-160/22	2,2	3	35,3	33,4	29,5	24,0	20,8	17,4													
40-200/ *	*	*	43,2	39,3	33,9	27,1															
40-200/40	4	5,5	52,4	48,8	43,7	37,0	33,1														
40-200/55	5,5	7,5	61,0	57,4	52,1	45,3	41,4														
40-250/75	7,5	10	75,7	71,4	66,1	59,4	55,3														
40-250/110	11	15	86,2	82,5	76,9	69,7	65,4	60,7													
50-125/11	1,1	1,5	14,4		13,2	11,6	10,5	9,4	4,2												
50-125/15	1,5	2	18,4		17,6	15,9	14,8	13,6	7,9	4,8											
50-160/22	2,2	3	26,2		24,4	22,4	21,3	19,9	13,7	10,1											
50-160/30	3	4	33,1		30,3	28,3	27,1	25,7	19,3	15,4											
50-160/40	4	5,5	39,1		36,6	34,5	33,3	31,9	25,0	20,7											
50-200/55	5,5	7,5	47,9		44,9	42,6	41,2	39,7	31,7												
50-200/75	7,5	10	57,4		54,3	51,9	50,4	48,8	40,5	35,1											
50-250/**	**	**	64,4		60,9	58,7	57,4	56,1	49,2	44,8											
50-250/110	11	15	75,0		71,3	69,0	67,7	66,2	59,2	54,9											
50-250/150	15	20	87,4		83,9	81,6	80,2	78,7	71,5	67,1	56,3										
65-125/22	2,2	3	17,8					16,3	13,9	12,3	8,3	5,9									
65-125/30	3	4	21,8					20,3	17,9	16,3	12,3	10,0									
65-125/40	4	5,5	25,7					24,6	22,5	21,1	17,3	15,1	9,6								
65-160/55	5,5	7,5	34,1					32,8	30,6	29,1	25,2	22,9	17,4								
65-160/75	7,5	10	41,6					39,3	36,7	34,9	30,8	28,3	22,7	19,6							
65-200/**	**	**	52,0					48,7	45,8	43,9	38,9	35,8	28,1	23,4							
65-200/110	11	15	58,8					54,3	51,1	49,1	44,0	40,8	32,7	27,8							
65-250/150	15	20	69,8					65,5	62,7	61,1	56,9	54,4	48,1	44,4	40,1						
65-250/185	18,5	25	78,6					73,7	70,8	69,1	65,0	62,5	56,5	52,9	48,8						
65-250/220	22	30	86,8					82,9	80,1	78,3	74,1	71,5	65,5	62,0	58,1	49,0					
80-125/30	3	4	15,8					14,4	13,8	12,2	11,3	9,3	8,2	7,1							
80-125/40	4	5,5	19,0					17,8	17,3	15,9	15,1	13,3	12,3	11,2							
80-125/55	5,5	7,5	23,6					22,3	21,8	20,7	20,0	18,3	17,4	16,4	14,0						
80-160/75	7,5	10	28,2					26,7	26,3	25,4	24,9	23,5	22,7	21,8	19,7	17,8					
80-200/110	11	15	40,7					38,1	37,5	35,9	35,0	32,9	31,7	30,4	27,5	25,0					
80-200/150	15	20	51,1					48,0	47,3	45,7	44,7	42,6	41,5	40,2	37,3	34,8					
80-200/185	18,5	25	57,2					54,0	53,3	51,8	50,9	49,0	47,8	46,6	43,8	41,4					
80-200/220	22	30	63,9					60,9	60,3	58,8	58,0	56,1	55,0	53,8	51,0	48,6	43,8				
100-160/110	11	15	29,0									27,6	26,8	26,3	25,7	24,5	23,4	21,4	16,5		
100-200/185	18,5	25	39,8										37,9	37,5	37,0	36,0	35,2	33,5	29,5	24,5	
100-200/220	22	30	47,5											45,3	44,9	44,4	43,4	42,5	40,8	36,7	31,6

* FCTE 40-200/40A : 4 [kW] - 5.5 [HP] , FCTS 40-200/30 : 3 [kW] - 4 [HP]

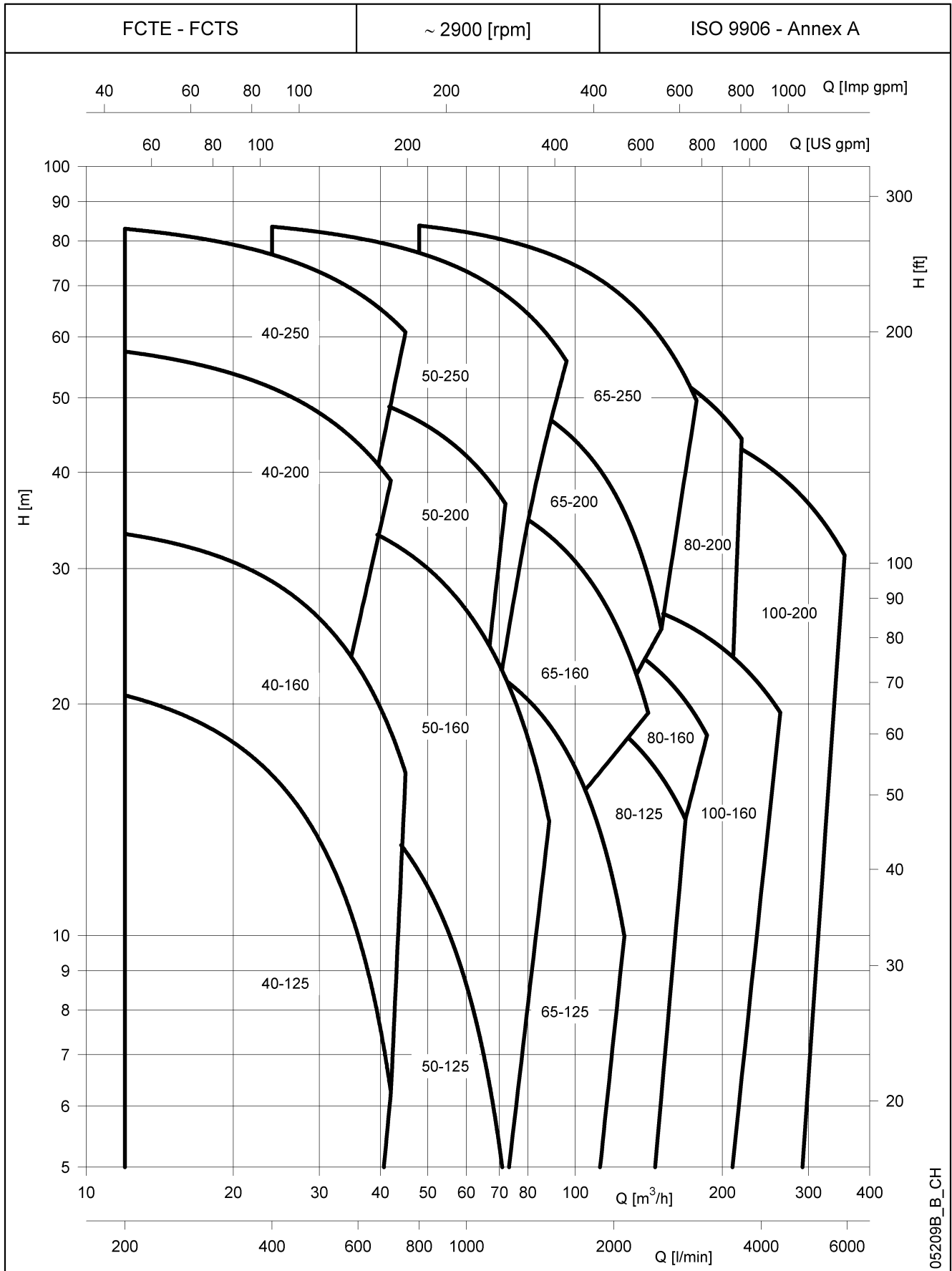
fcte-fcts-2p50S_c_th

** FCTE 50-250/92 : 9.2 [kW] - 12.5 [HP] , FCTS 50-250/110A : 11 [kW] - 15 [HP]

FCTE 65-200/92 : 9.2 [kW] - 12.5 [HP] , FCTS 65-200/110A : 11 [kW] - 15 [HP]

Performances according to ISO 9906 - Annex A.

**FCTE-FCTS SERIES (PARALLEL OPERATION)
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 2 POLES**



The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

FCTE-FCTS SERIES (PARALLEL OPERATION) HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 2 POLES

PUMP TYPE	RATED POWER		Q = DELIVERY																		
			l/min	0	200	400	600	700	800	1000	1200	1600	1800	2000	2200	2400	2800	3200	3500	4250	5550
	2 x kW	2 x HP	m ³ /h	0	12	24	36	42	48	60	72	96	108	120	132	144	168	192	210	255	333
H = TOTAL HEAD METRES COLUMN OF WATER																					
40-125/07	0,75	1	17,9	15,9	11,7	5,6															
40-125/11	1,1	1,5	23,0	20,5	16,2	10,0	6,3														
40-160/15	1,5	2	28,4	26,0	21,6	15,4	11,7														
40-160/22	2,2	3	35,3	33,3	28,9	22,3	18,4														
40-200/ *	*	*	43,4	39,2	33,3	25,6															
40-200/40	4	5,5	52,5	48,5	42,8	35,3															
40-200/55	5,5	7,5	61,2	57,5	51,5	43,6	39,0														
40-250/75	7,5	10	75,1	69,5	62,8	54,6	49,9														
40-250/110	11	15	86,8	83,0	76,8	68,5	63,6														
50-125/11	1,1	1,5	14,2		12,7	10,6	9,3	7,8	4,4												
50-125/15	1,5	2	18,4		17,1	15,0	13,6	12,1	8,6	4,6											
50-160/22	2,2	3	26,4		24,0	21,6	20,1	18,5	14,8	10,4											
50-160/30	3	4	33,3		30,1	27,5	26,0	24,3	20,4	15,8											
50-160/40	4	5,5	39,5		36,8	34,1	32,5	30,7	26,5	21,6											
50-200/55	5,5	7,5	47,6		44,2	41,4	39,6	37,7	33,2												
50-200/75	7,5	10	56,9		53,3	50,4	48,6	46,6	42,0	36,4											
50-250/**	**	**	64,6		61,0	58,3	56,7	54,8	50,6	45,6											
50-250/110	11	15	75,1		71,2	68,4	66,7	64,9	60,8	55,9											
50-250/150	15	20	87,3		83,5	80,7	79,0	77,2	73,0	68,1	55,9										
65-125/22	2,2	3	18,1					15,8	14,5	12,8	8,3	5,4									
65-125/30	3	4	22,1					19,8	18,4	16,8	12,4	9,6									
65-125/40	4	5,5	25,7					24,2	23,0	21,5	17,4	14,7	11,7								
65-160/55	5,5	7,5	34,0					32,4	31,1	29,4	25,1	22,4	19,4								
65-160/75	7,5	10	41,8					39,4	37,9	36,1	31,6	28,8	25,7	22,3							
65-200/**	**	**	52,0					48,5	46,9	44,9	39,7	36,3	32,5	28,0							
65-200/110	11	15	58,7					54,2	52,5	50,4	45,1	41,7	37,7	33,2	27,9						
65-250/150	15	20	69,6					65,7	64,2	62,4	57,8	54,9	51,7	48,0	43,8						
65-250/185	18,5	25	78,3					74,1	72,5	70,7	66,0	63,2	60,0	56,4	52,4	43,0					
65-250/220	22	30	87,3					83,8	82,1	80,2	75,3	72,4	69,2	65,7	61,8	53,2					
80-125/30	3	4	15,7							14,1	12,4	11,3	10,2	9,0	7,8						
80-125/40	4	5,5	18,9							17,7	16,2	15,2	14,2	13,1	11,9						
80-125/55	5,5	7,5	23,6							21,7	20,4	19,6	18,8	17,8	16,7	14,2					
80-160/75	7,5	10	28,4							26,8	25,7	25,0	24,3	23,4	22,4	20,2					
80-200/110	11	15	40,9							38,2	36,5	35,5	34,3	33,1	31,8	28,7	25,1	22,1			
80-200/150	15	20	50,4							47,4	45,7	44,7	43,6	42,4	41,1	38,0	34,5	31,5			
80-200/185	18,5	25	57,8							54,5	52,8	51,8	50,7	49,5	48,2	45,3	41,9	39,0			
80-200/220	22	30	63,6							61,3	59,7	58,7	57,6	56,4	55,1	52,1	48,7	45,8			
100-160/110	11	15	28,8									27,7	27,3	26,8	26,3	25,0	23,5	22,3	18,5		
100-200/185	18,5	25	39,7											37,8	37,4	36,4	35,2	34,1	31,0	23,4	
100-200/220	22	30	47,5											45,3	44,9	43,9	42,8	41,8	38,7	30,9	

* FCTE 40-200/40A : 4 [kW] - 5.5 [HP] , FCTS 40-200/30 : 3 [kW] - 4 [HP]

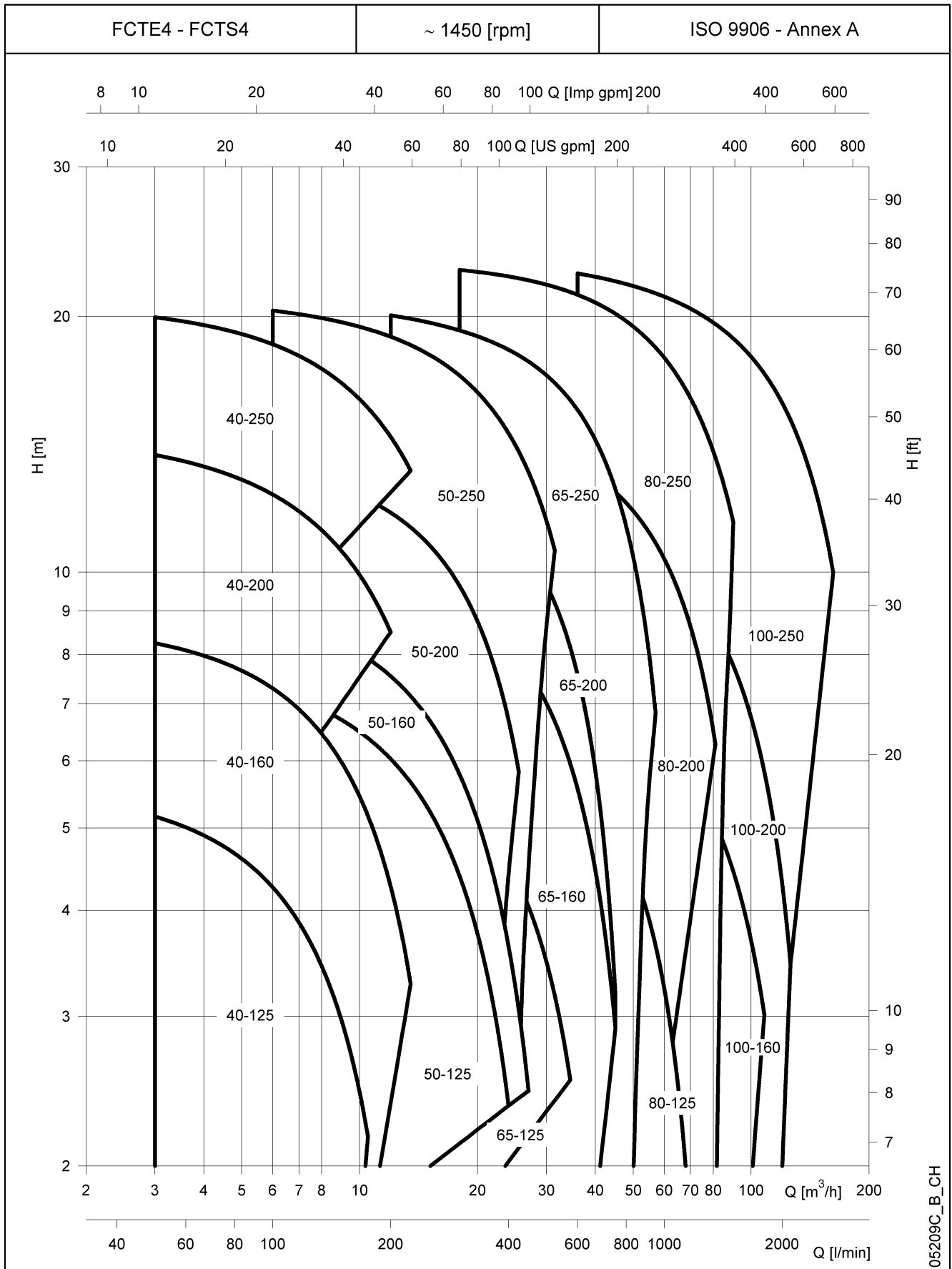
fcte-fcts-2p50P_c_th

** FCTE 50-250/92 : 9.2 [kW] - 12.5 [HP] , FCTS 50-250/110A : 11 [kW] - 15 [HP]

FCTE 65-200/92 : 9.2 [kW] - 12.5 [HP] , FCTS 65-200/110A : 11 [kW] - 15 [HP]

Performances according to ISO 9906 - Annex A.

**FCTE4-FCTS4 SERIES (SINGLE OPERATION)
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 4 POLES**



The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

FCTE4-FCTS4 SERIES (SINGLE OPERATION) HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 4 POLES

PUMP TYPE	RATED POWER		Q = DELIVERY																	
			l/min	50	100	150	175	200	300	400	500	600	700	900	1200	1400	1600	1750	2000	2500
			0	3	6	9	10,5	12	18	24	30	36	42	54	72	84	96	105	120	150
		H = TOTAL HEAD METRES COLUMN OF WATER																		
		kW	HP																	
40-125/02A *	0,25	0,33	4,6	4,2	3,3	2,1														
40-125/02 *	0,25	0,33	5,7	5,2	4,3	3,0	2,2													
40-160/02 *	0,25	0,33	7,0	6,4	5,5	4,2	3,4	2,6												
40-160/03 *	0,37	0,5	8,8	8,3	7,3	6,0	5,2	4,3												
40-200/05	0,55	0,75	12,8	11,8	10,5	8,7	7,7													
40-200/07	0,75	1	14,5	13,6	12,2	10,3	9,3	8,1												
40-250/11	1,1	1,5	18,5	17,6	16,2	14,4	13,3	12,2												
40-250/15	1,5	2	20,9	20,0	18,6	16,7	15,6	14,4												
50-125/02 *	0,25	0,33	6,3		5,7	5,2	4,9	4,6	3,0											
50-125/03 *	0,37	0,5	7,9		7,3	6,8	6,4	6,0	4,3	2,4										
50-160/05 *	0,55	0,75	9,4		8,8	8,2	7,9	7,5	5,8	3,6										
50-200/07	0,75	1	11,7		10,7	10,0	9,6	9,2	7,1	4,2										
50-200/11	1,1	1,5	14,1		13,2	12,5	12,2	11,8	9,6	6,7										
50-250/15	1,5	2	18,1		17,0	16,3	16,0	15,6	13,7	11,3	8,1									
50-250/22	2,2	3	21,3		20,3	19,7	19,3	18,9	17,0	14,6	11,5									
65-125/03 *	0,37	0,5	5,6					4,9	4,3	3,4	2,3									
65-125/05 *	0,55	0,75	6,4					6,0	5,4	4,5	3,5									
65-160/07	0,75	1	8,4					8,0	7,3	6,3	5,2	3,8	2,3							
65-160/11	1,1	1,5	10,3					9,7	9,1	8,2	7,0	5,6	3,9							
65-200/15	1,5	2	14,3					13,2	12,3	11,2	9,7	7,6	4,8							
65-250/22	2,2	3	19,0					17,6	16,7	15,7	14,4	12,8	10,7	4,9						
65-250/30	3	4	21,4					20,1	19,3	18,3	17,1	15,5	13,6	8,5						
80-125/07	0,75	1	5,6						5,3	5,0	4,7	4,2	3,7	2,4						
80-125/11	1,1	1,5	7,0						6,6	6,3	6,0	5,7	5,2	4,0						
80-200/15	1,5	2	11,7						10,2	9,7	9,1	8,5	7,8	6,1						
80-200/22	2,2	3	14,7						13,3	12,8	12,2	11,5	10,8	9,2	6,3					
80-200/30	3	4	16,7						15,1	14,6	14,0	13,4	12,8	11,3	8,2					
80-250/40	4	5,5	19,6						19,1	18,6	18,1	17,4	16,7	14,8	11,2	8,2				
80-250/55	5,5	7,5	23,3						22,7	22,3	21,8	21,2	20,5	18,9	15,6	12,9				
100-160/15	1,5	2	7,9								7,6	7,4	7,1	6,4	5,0	4,0	2,9	2,1		
100-200/22	2,2	3	9,7									9,1	8,9	8,2	7,0	6,0	4,9	4,0	2,3	
100-200/30	3	4	11,6									10,9	10,7	10,0	8,8	7,8	6,6	5,6	3,8	
100-250/40	4	5,5	15,2									14,4	14,2	13,6	12,3	11,3	10,1	9,1	7,2	
100-250/55	5,5	7,5	18,7									17,8	17,6	17,0	15,7	14,8	13,6	12,7	10,9	6,7
100-250/75	7,5	10	21,6									21,2	20,9	20,4	19,2	18,2	17,1	16,1	14,4	10,0

* FCTE4 VERSION ONLY

fcte4-fcts4-4p50S_e_th

Performances according to ISO 9906 - Annex A.

**FCTE4-FCTS4 SERIES (PARALLEL OPERATION)
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 4 POLES**



05209D_B_CH

The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

FCTE4-FCTS4 SERIES (PARALLEL OPERATION) HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 4 POLES

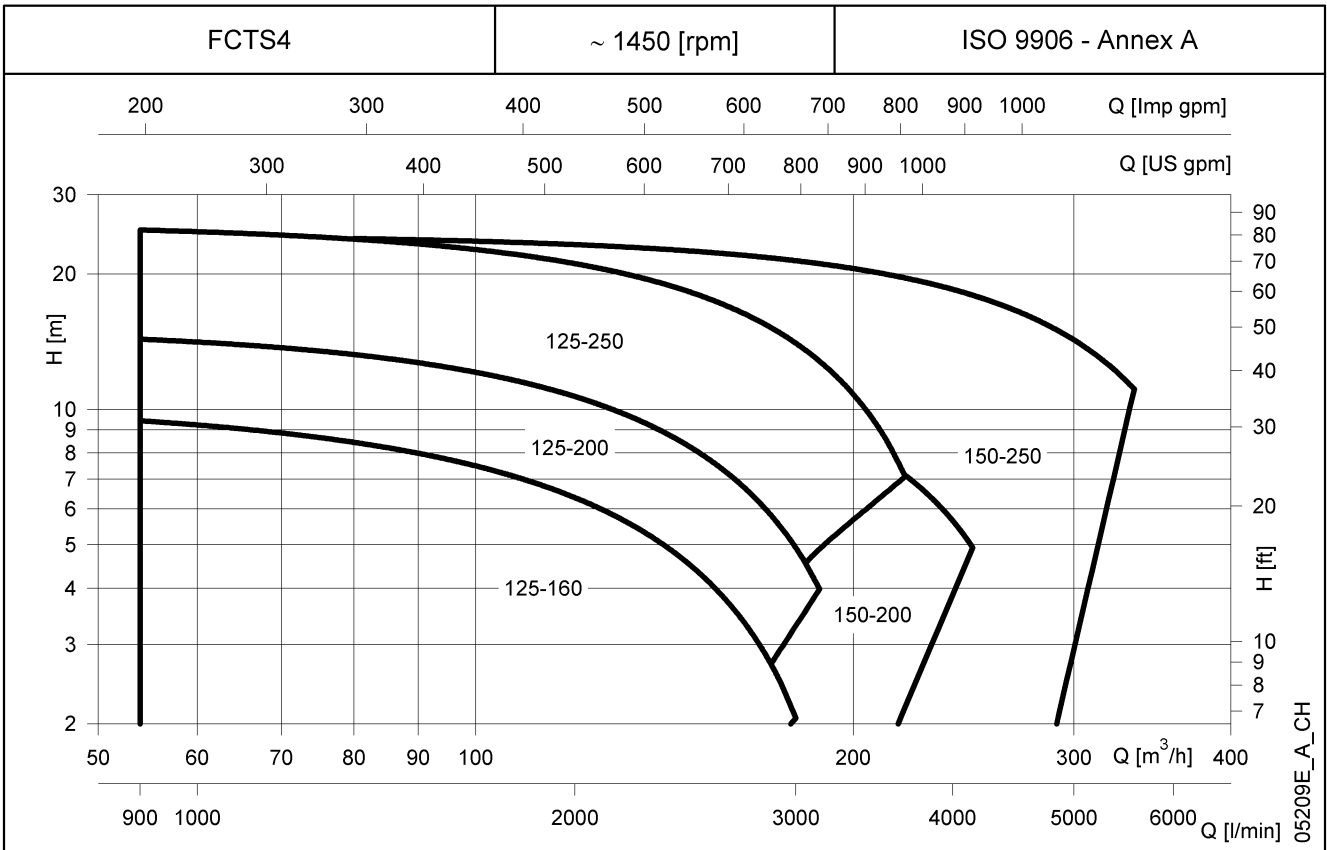
PUMP TYPE	RATED POWER		Q = DELIVERY																		
	2 x kW	2 x HP	l/min	100	200	300	350	400	600	700	900	1000	1100	1600	1800	2400	3000	3500	4000	4600	
			m ³ /h	0	6	12	18	21	24	36	42	54	60	66	96	108	144	180	210	240	276
H = TOTAL HEAD METRES COLUMN OF WATER																					
40-125/02A *	0,25	0,33	4,6	4,1	3,2	1,7															
40-125/02 *	0,25	0,33	5,8	5,2	4,2	2,6															
40-160/02 *	0,25	0,33	7,0	6,4	5,4	3,8	2,9														
40-160/03 *	0,37	0,5	8,8	8,3	7,2	5,6	4,6	3,5													
40-200/05	0,55	0,75	12,9	11,8	10,3	8,4															
40-200/07	0,75	1	14,8	13,6	12,1	10,2	9,0														
40-250/11	1,1	1,5	18,5	17,6	16,1	14,0	12,8														
40-250/15	1,5	2	21,1	20,0	18,5	16,4	15,2	13,9													
50-125/02 *	0,25	0,33	6,3		5,6	5,0	4,6	4,2	2,2												
50-125/03 *	0,37	0,5	8,1		7,2	6,5	6,1	5,7	3,6	2,3											
50-160/05 *	0,55	0,75	9,6		8,8	8,1	7,7	7,2	5,0	3,6											
50-200/07	0,75	1	11,5		10,6	9,8	9,3	8,8	6,3	4,7											
50-200/11	1,1	1,5	14,0		13,0	12,3	11,8	11,3	8,7	7,1											
50-250/15	1,5	2	18,1		17,0	16,2	15,7	15,3	12,9	11,5	7,9										
50-250/22	2,2	3	21,3		20,2	19,4	19,0	18,5	16,0	14,6	11,0										
65-125/03 *	0,37	0,5	5,5					4,7	4,0	3,5	2,2										
65-125/05 *	0,55	0,75	6,3					5,9	5,2	4,7	3,4	2,7									
65-160/07	0,75	1	8,5					7,8	7,0	6,5	5,3	4,5	3,7								
65-160/11	1,1	1,5	10,2					9,7	8,9	8,3	7,0	6,2	5,4								
65-200/15	1,5	2	14,4					13,1	12,1	11,4	9,8	8,8	7,6								
65-250/22	2,2	3	19,3					17,7	16,6	16,1	14,6	13,8	12,8	5,9							
65-250/30	3	4	21,6					20,2	19,3	18,7	17,3	16,5	15,5	9,2							
80-125/07	0,75	1	5,7						5,2	5,0	4,6	4,4	4,1	2,4							
80-125/11	1,1	1,5	7,0						6,6	6,4	6,1	5,9	5,6	4,1	3,3						
80-200/15	1,5	2	11,5						10,1	9,8	9,2	8,9	8,6	6,5	5,5						
80-200/22	2,2	3	14,8						13,2	12,9	12,3	12,0	11,7	9,7	8,7						
80-200/30	3	4	16,7						15,7	15,4	14,9	14,6	14,2	12,0	10,9	6,8					
80-250/40	4	5,5	19,8						19,1	18,8	18,3	17,9	17,6	15,3	14,1	9,9					
80-250/55	5,5	7,5	23,2						22,6	22,4	21,9	21,6	21,3	19,2	18,2	14,3					
100-160/15	1,5	2	7,8								7,5	7,4	7,3	6,5	6,1	4,5	2,5				
100-200/22	2,2	3	9,7										9,1	8,3	7,9	6,4	4,5	2,6			
100-200/30	3	4	11,6										11,0	10,2	9,8	8,3	6,4	4,5	2,1		
100-250/40	4	5,5	15,1										14,4	13,7	13,3	11,8	9,9	7,9	5,5		
100-250/55	5,5	7,5	18,7										17,8	17,1	16,7	15,5	13,7	11,8	9,5	6,0	
100-250/75	7,5	10	21,6										21,1	20,4	20,1	18,8	17,1	15,3	13,1	9,9	

* FCTE4 VERSION ONLY

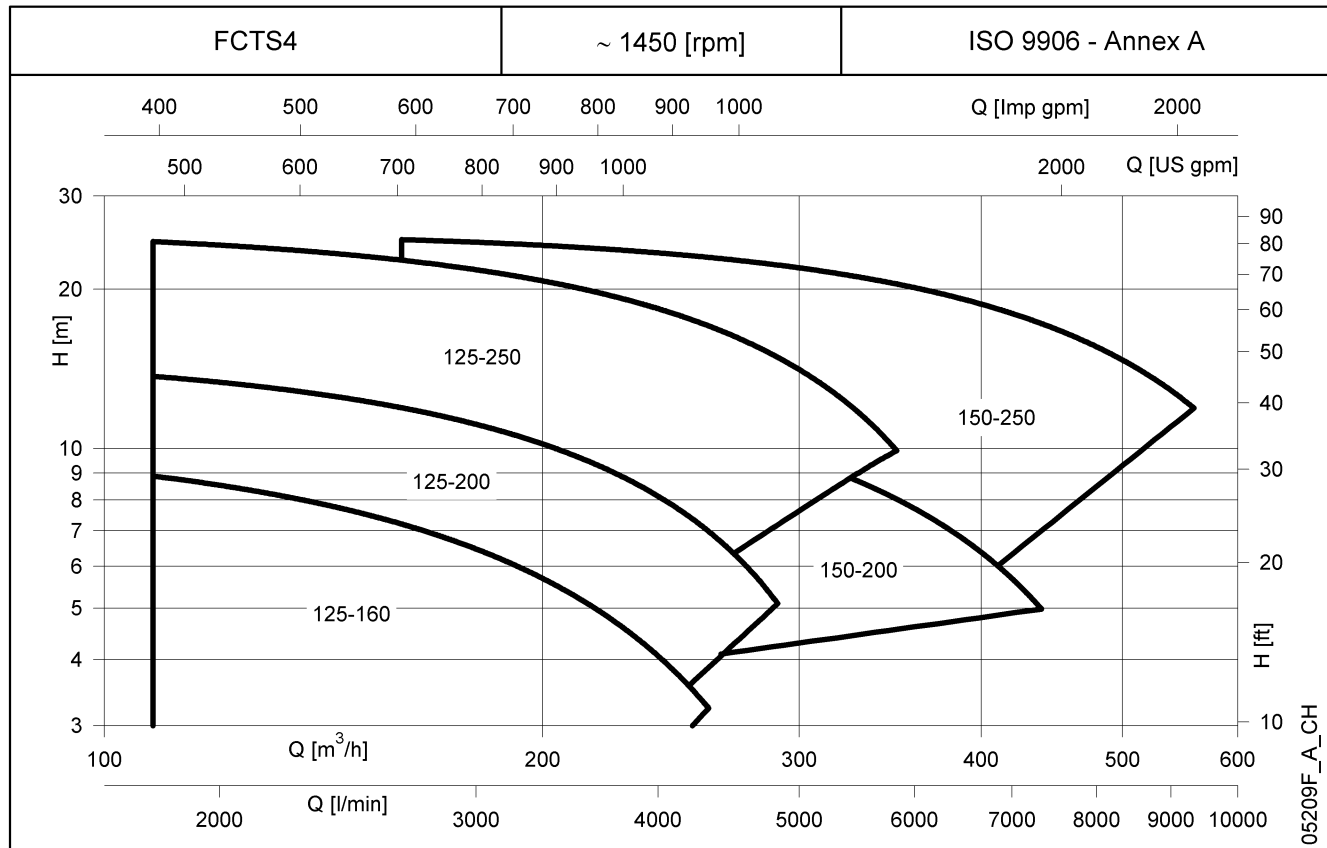
fcte4-fcts4-4p50P_e_th

Performances according to ISO 9906 - Annex A.

**FCTS4 SERIES (SINGLE OPERATION)
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 4 POLES**



**FCTS4 SERIES (PARALLEL OPERATION)
HYDRAULIC PERFORMANCE RANGE AT 50 Hz, 4 POLES**



The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

FCTS4 SERIES (SINGLE OPERATION) HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 4 POLES

PUMP TYPE	RATED POWER		Q = DELIVERY																	
			l/min 0	900	1100	1333	1583	1667	1833	1917	2000	2333	2500	3000	3167	3667	4150	4500	5000	5333
			m ³ /h 0	54	66	80	95	100	110	115	120	140	150	180	190	220	249	270	300	320
kW		HP	H = TOTAL HEAD METRES COLUMN OF WATER																	
125-160/30	3	4	10,5	9,4	9,0	8,4	7,7	7,5	6,9	6,7	6,4	5,1	4,4	2,1						
125-200/40	4	5,5	12,7	11,7	11,2	10,5	9,6	9,3	8,5	8,1	7,7	5,7	4,6							
125-200/55	5,5	7,5	15,1	14,3	13,9	13,2	12,4	12,1	11,4	11,1	10,7	9,0	8,1	4,9						
125-250/75	7,5	10	20,5	19,4	18,8	18,0	16,9	16,5	15,6	15,1	14,6	12,4	11,1	6,7	5,0					
125-250/110	11	15	26,1	25,1	24,6	23,9	23,0	22,7	21,9	21,5	21,1	19,1	18,0	14,0	12,5	7,1				
150-200/55	5,5	7,5	11,8			9,6	9,1	9,0	8,6	8,5	8,3	7,5	7,1	5,7	5,2	3,5				
150-200/75	7,5	10	15,4			13,4	12,9	12,8	12,5	12,3	12,1	11,4	11,0	9,6	9,0	7,1	4,9			
150-250/110	11	15	17,2			16,6	16,4	16,2	16,0	15,9	15,7	15,1	14,8	13,5	13,0	11,3	9,4	7,8	5,2	
150-250/150	15	20	21,1			20,7	20,4	20,3	20,1	20,0	19,9	19,4	19,1	18,0	17,6	16,1	14,3	12,8	10,4	8,5
150-250/185	18,5	25	24,6			24,0	23,7	23,7	23,5	23,4	23,3	22,7	22,5	21,4	21,0	19,6	17,9	16,6	14,3	12,5

Performances according to ISO 9906 - Annex A.

lmz-fcts4-4p50S_a_th

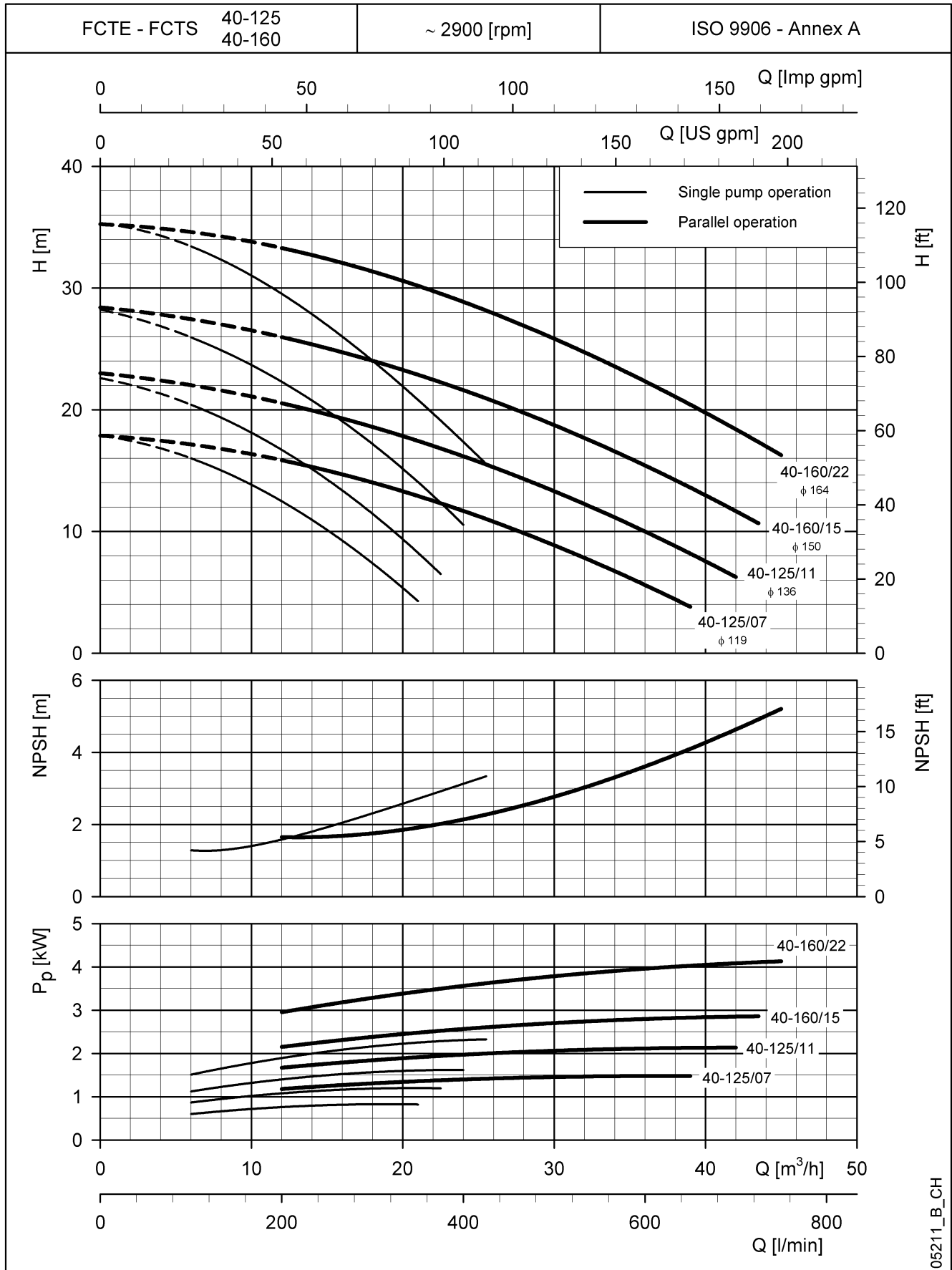
FCTS4 SERIES (PARALLEL OPERATION) HYDRAULIC PERFORMANCE TABLE AT 50 Hz, 4 POLES

PUMP TYPE	RATED POWER		Q = DELIVERY																	
			l/min 0	1800	2200	2667	3000	3250	3500	3750	4000	4333	4833	5200	5667	6500	7333	7667	8333	9000
			m ³ /h 0	108	132	160	180	195	210	225	240	260	290	312	340	390	440	460	500	540
2 x kW		2 x HP	H = TOTAL HEAD METRES COLUMN OF WATER																	
125-160/30	3	4	10,5	8,9	8,2	7,2	6,5	5,9	5,3	4,7	4,1	3,2								
125-200/40	4	5,5	12,9	10,7	9,9	8,8	8,0	7,3	6,6	5,8	5,0	3,9								
125-200/55	5,5	7,5	15,4	13,7	13,0	11,9	11,1	10,4	9,7	9,0	8,1	7,0	5,1							
125-250/75	7,5	10	20,9	18,7	17,9	16,7	15,7	14,9	13,9	12,9	11,8	10,1	7,2							
125-250/110	11	15	26,1	24,6	23,8	22,7	21,8	21,0	20,2	19,3	18,4	17,1	14,9	13,2	10,8					
150-200/55	5,5	7,5	11,6			9,0	8,6	8,2	7,9	7,5	7,1	6,6	5,8	5,2	4,5					
150-200/75	7,5	10	15,4			13,1	12,7	12,4	12,0	11,6	11,2	10,7	9,9	9,2	8,3	6,7	5,0			
150-250/110	11	15	18,7			17,5	17,2	16,9	16,6	16,3	16,0	15,5	14,7	14,0	13,1	11,2	9,0	8,0		
150-250/150	15	20	22,7			21,8	21,5	21,3	21,0	20,7	20,4	20,0	19,2	18,6	17,7	15,9	13,8	12,9	10,9	8,7
150-250/185	18,5	25	25,4			24,8	24,5	24,3	24,0	23,7	23,4	23,0	22,2	21,6	20,8	19,1	17,2	16,4	14,7	12,9

Performances according to ISO 9906 - Annex A.

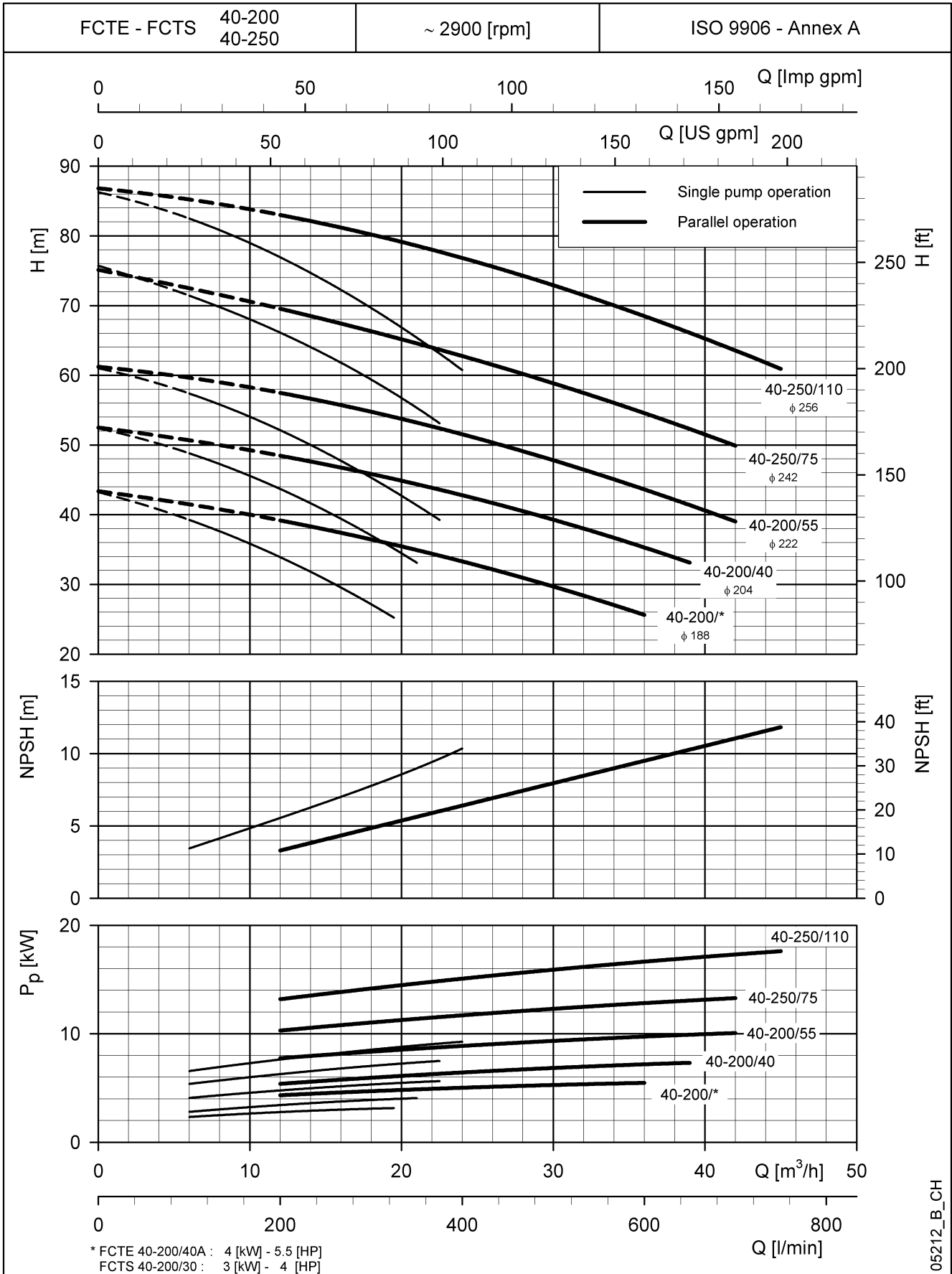
lmz-fcts4-4p50P_b_th

**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



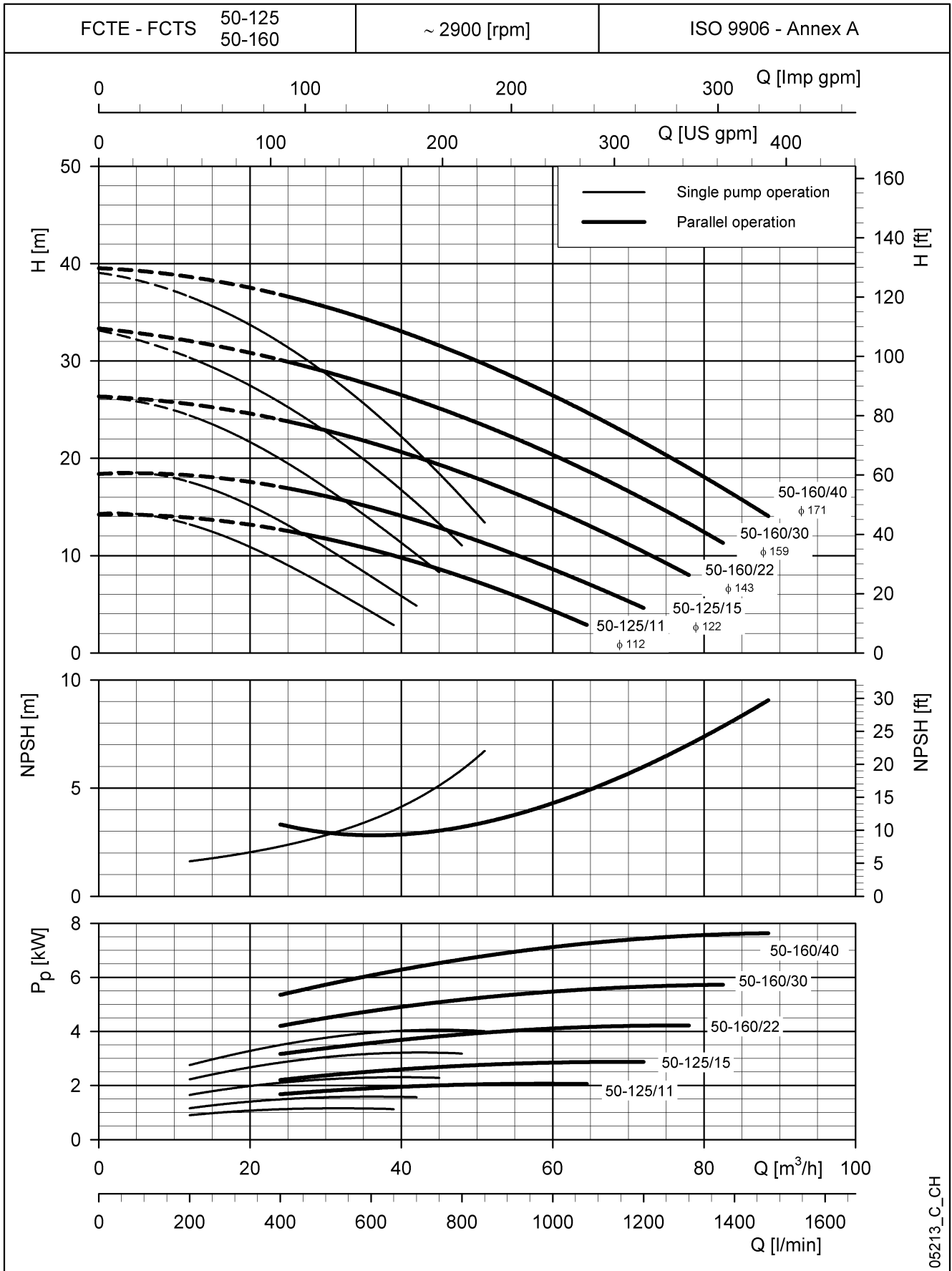
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



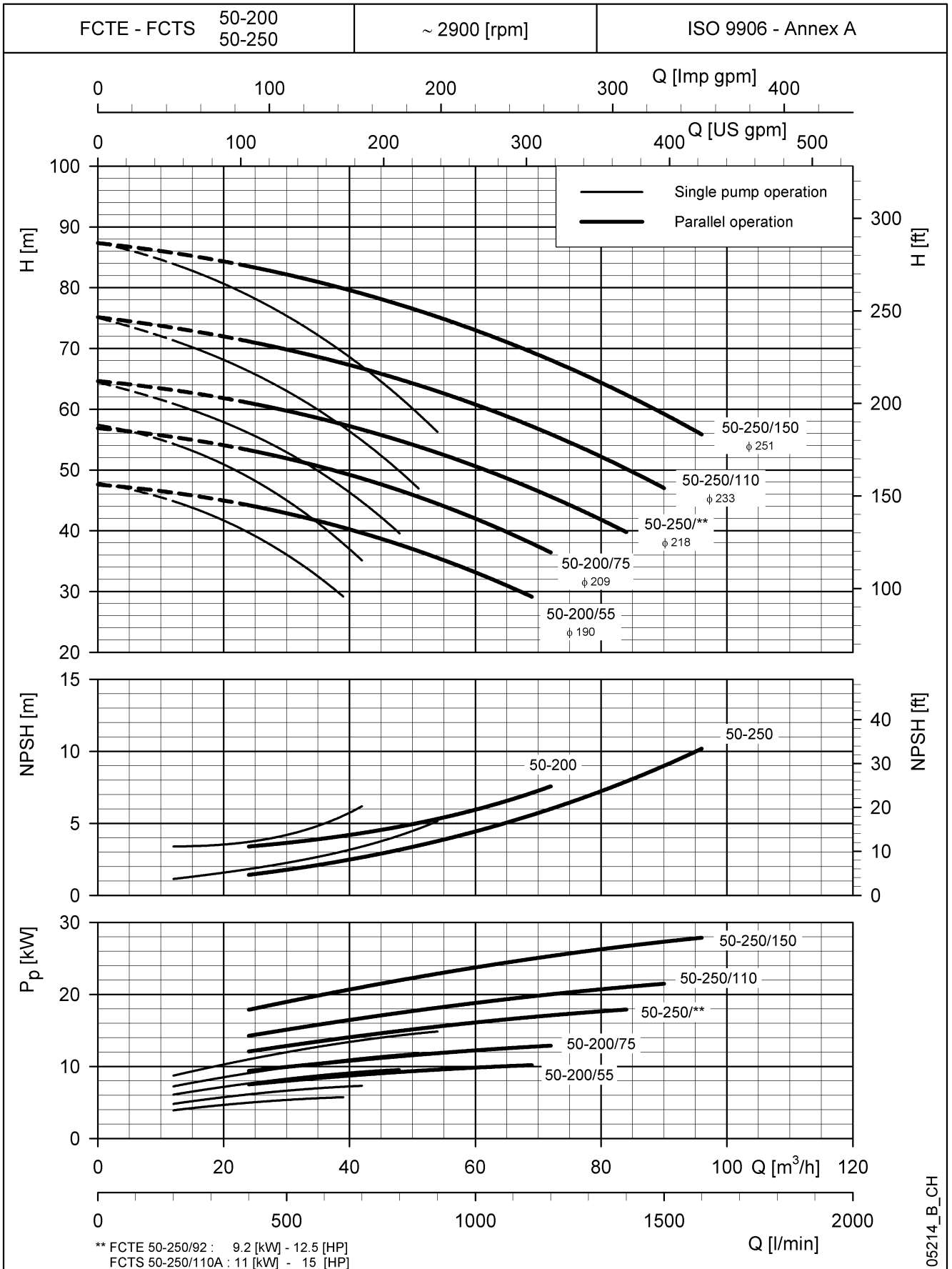
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
 The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



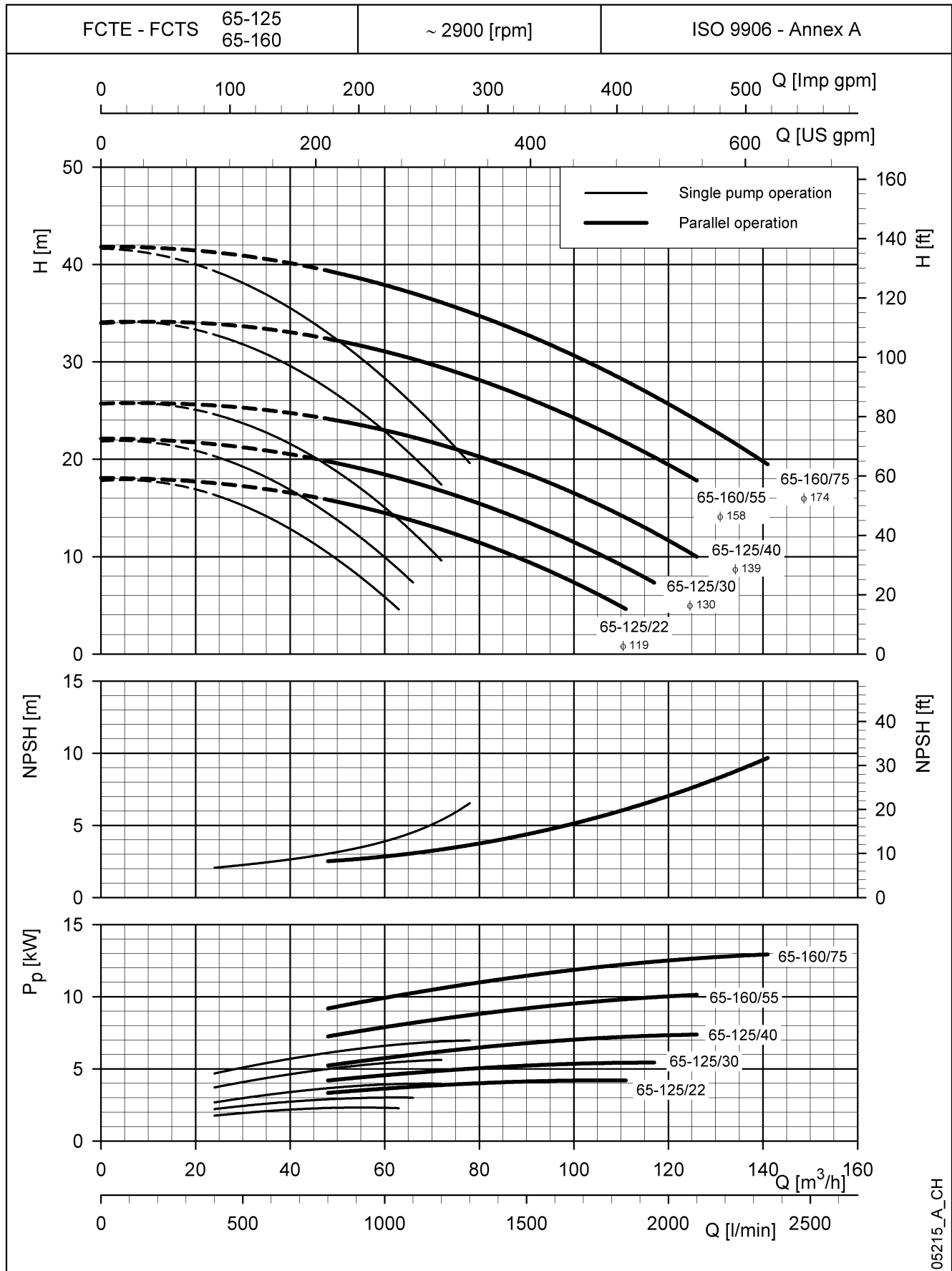
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
 The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
 The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

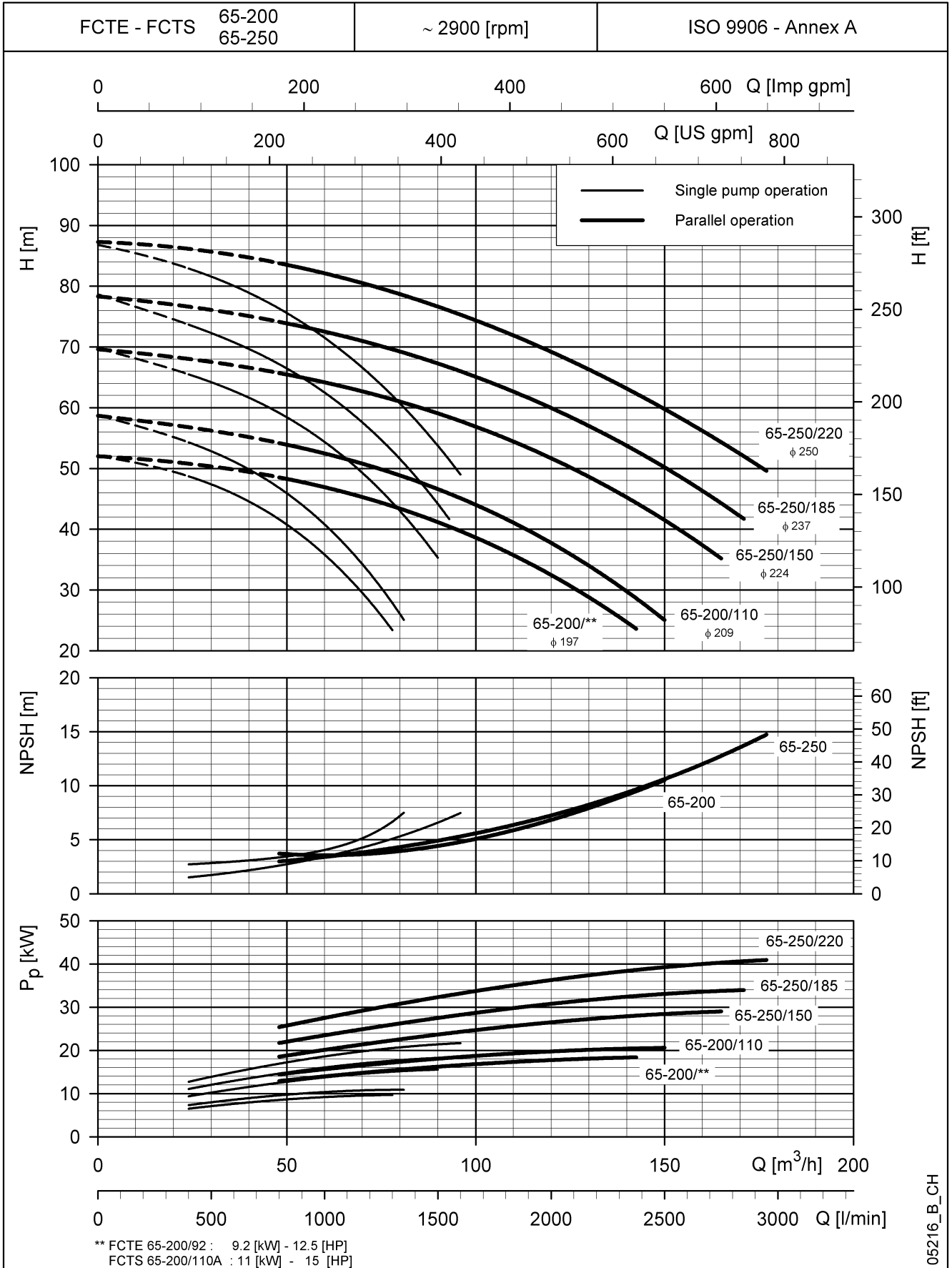
**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

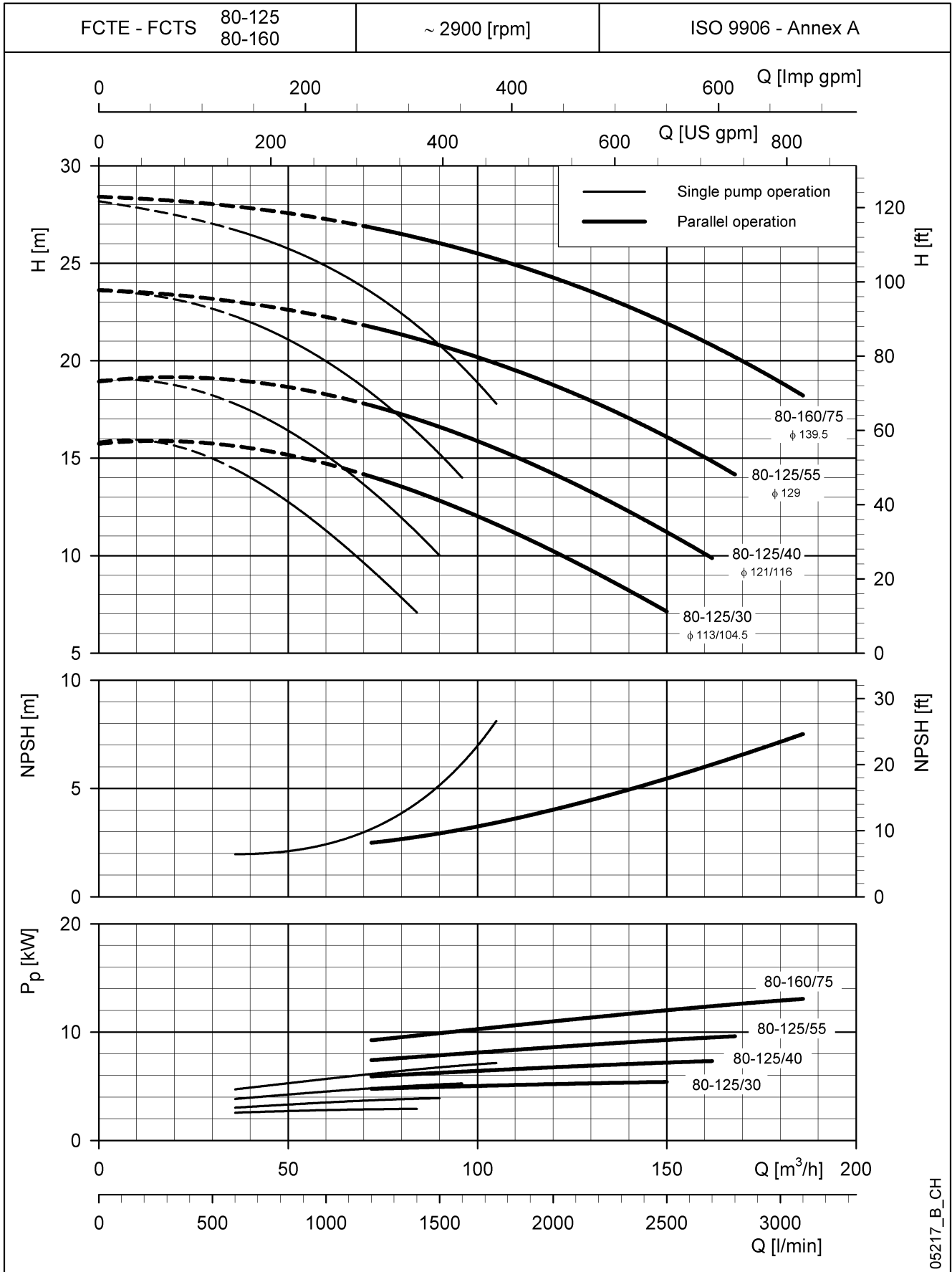
05215_A_CH

**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



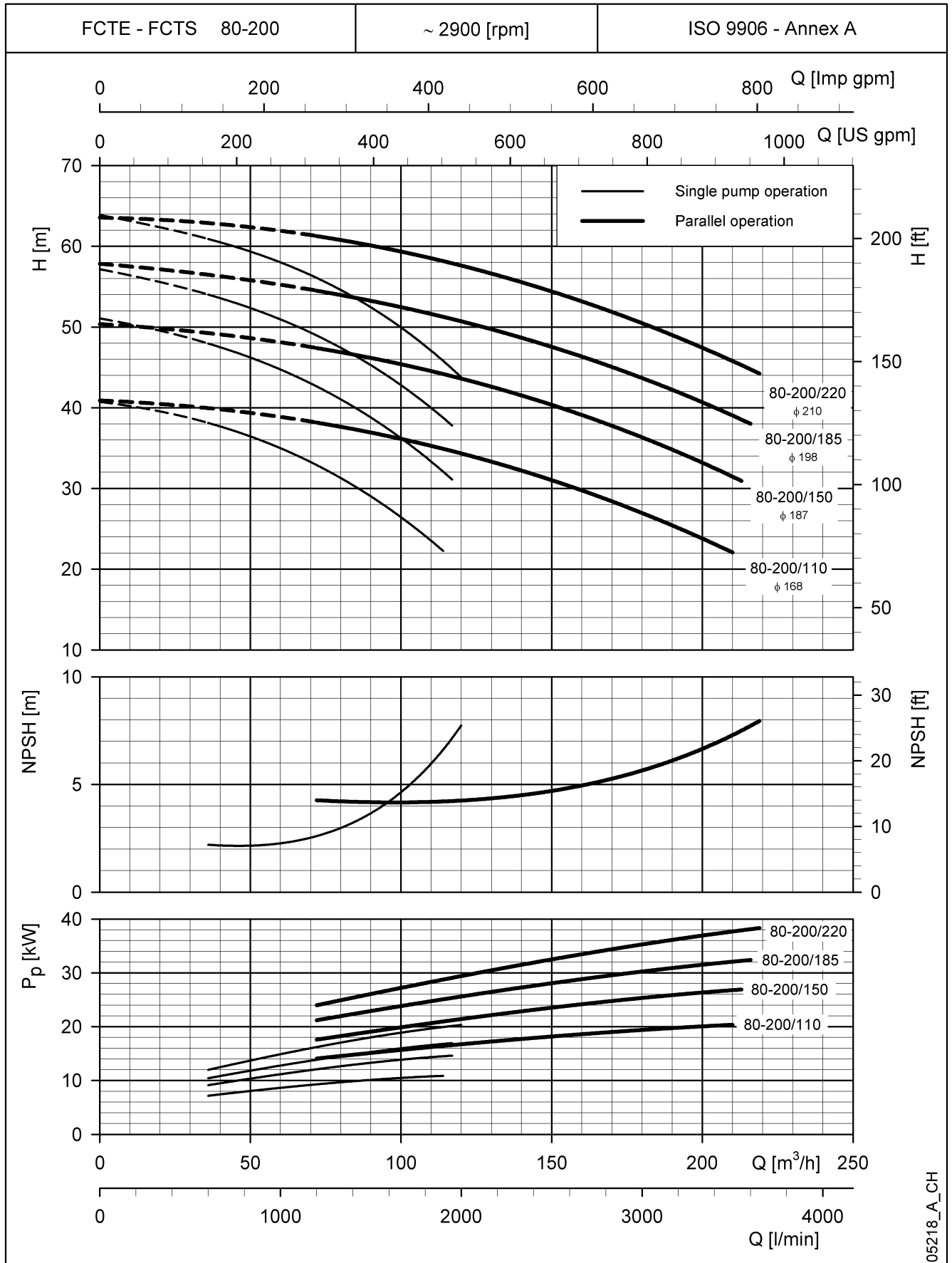
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



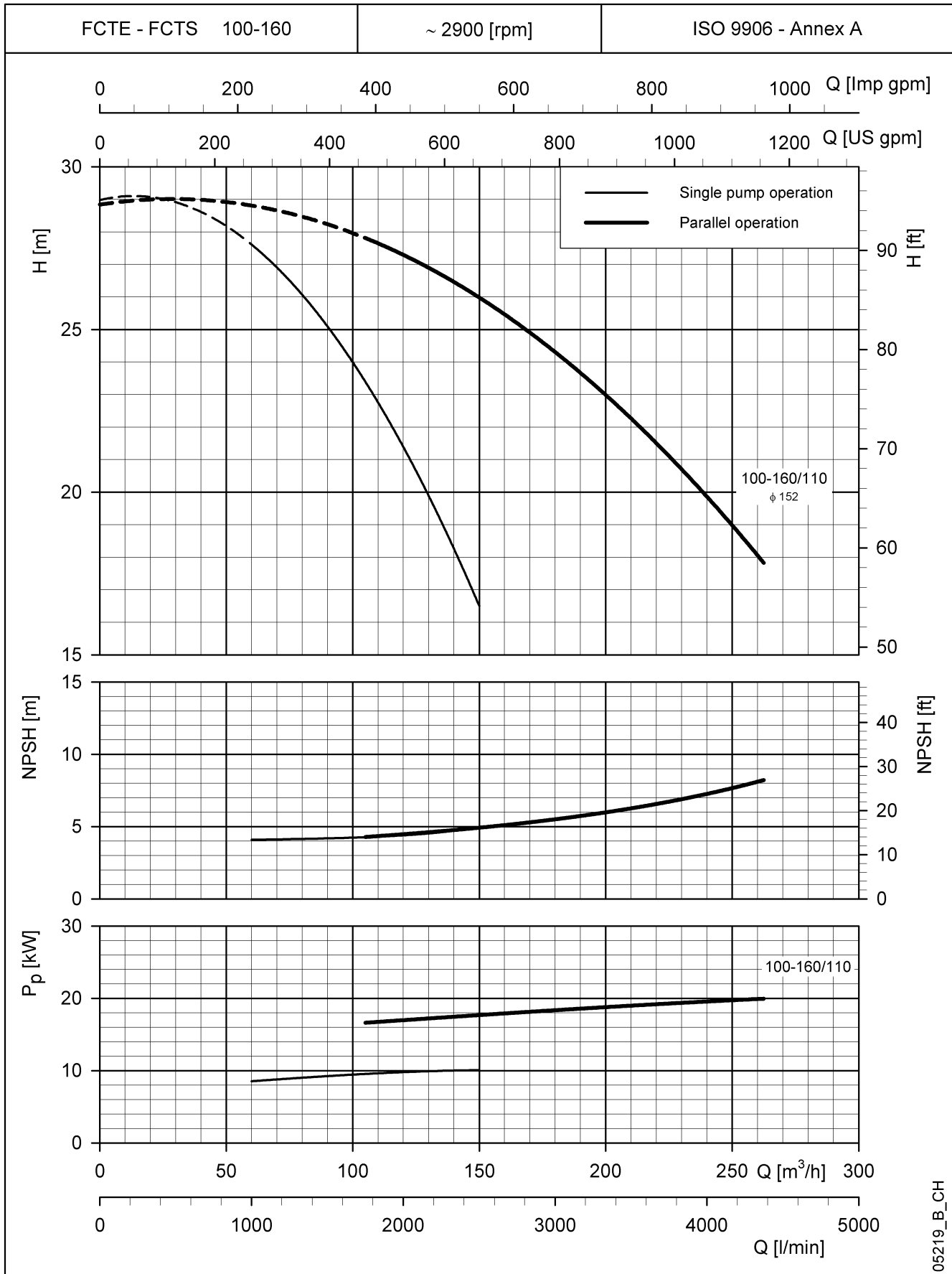
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
 The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



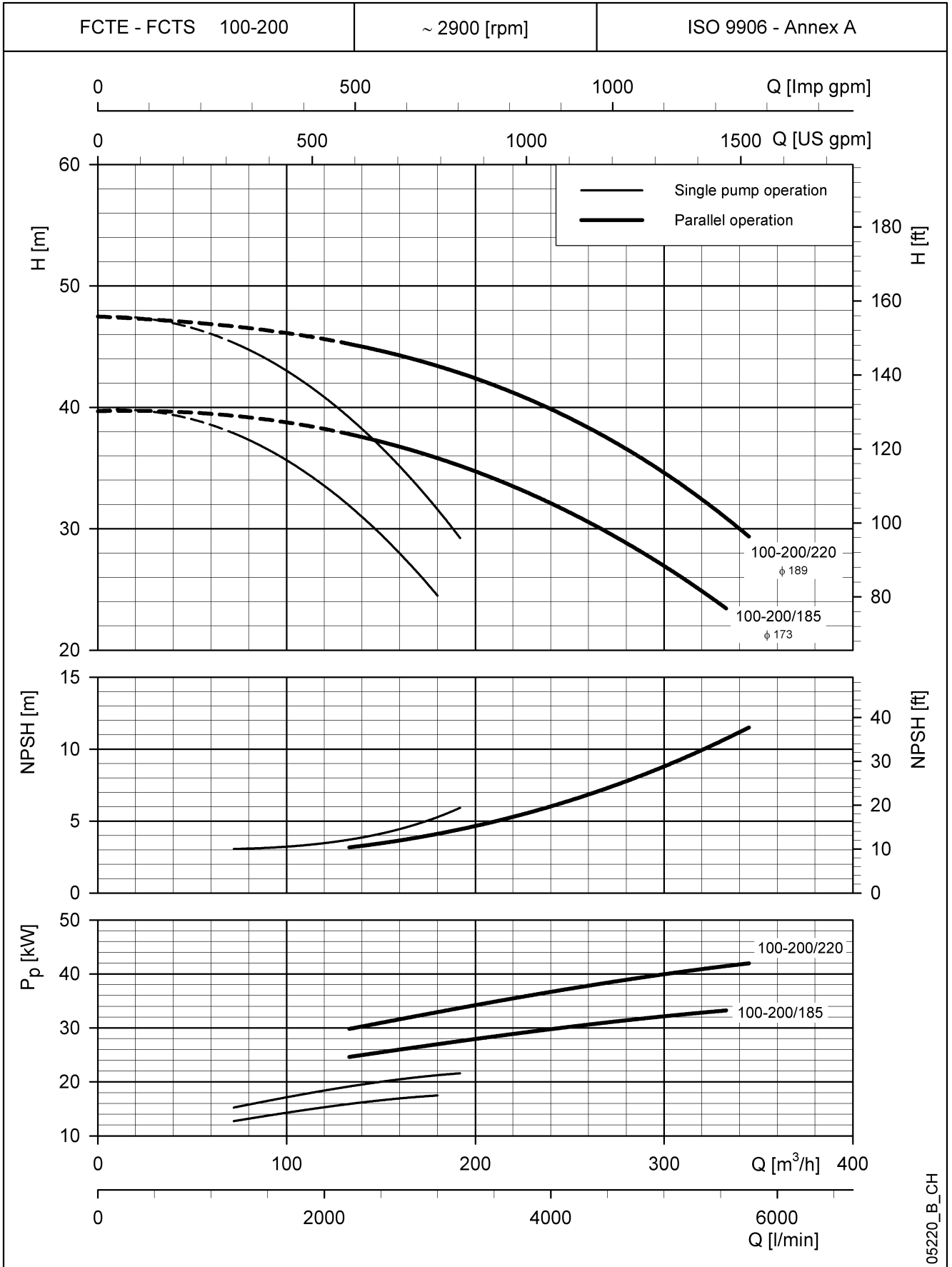
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



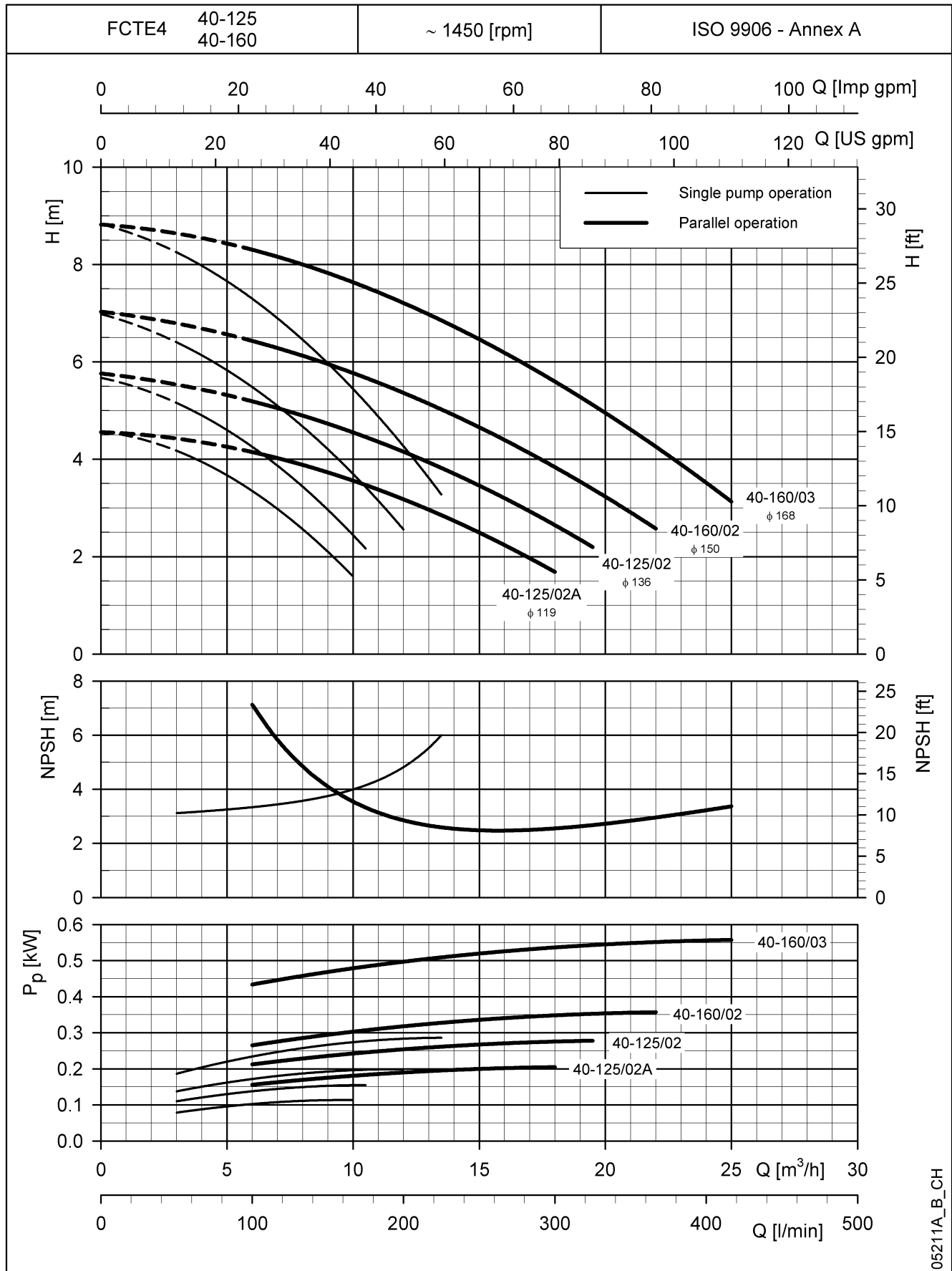
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE-FCTS SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

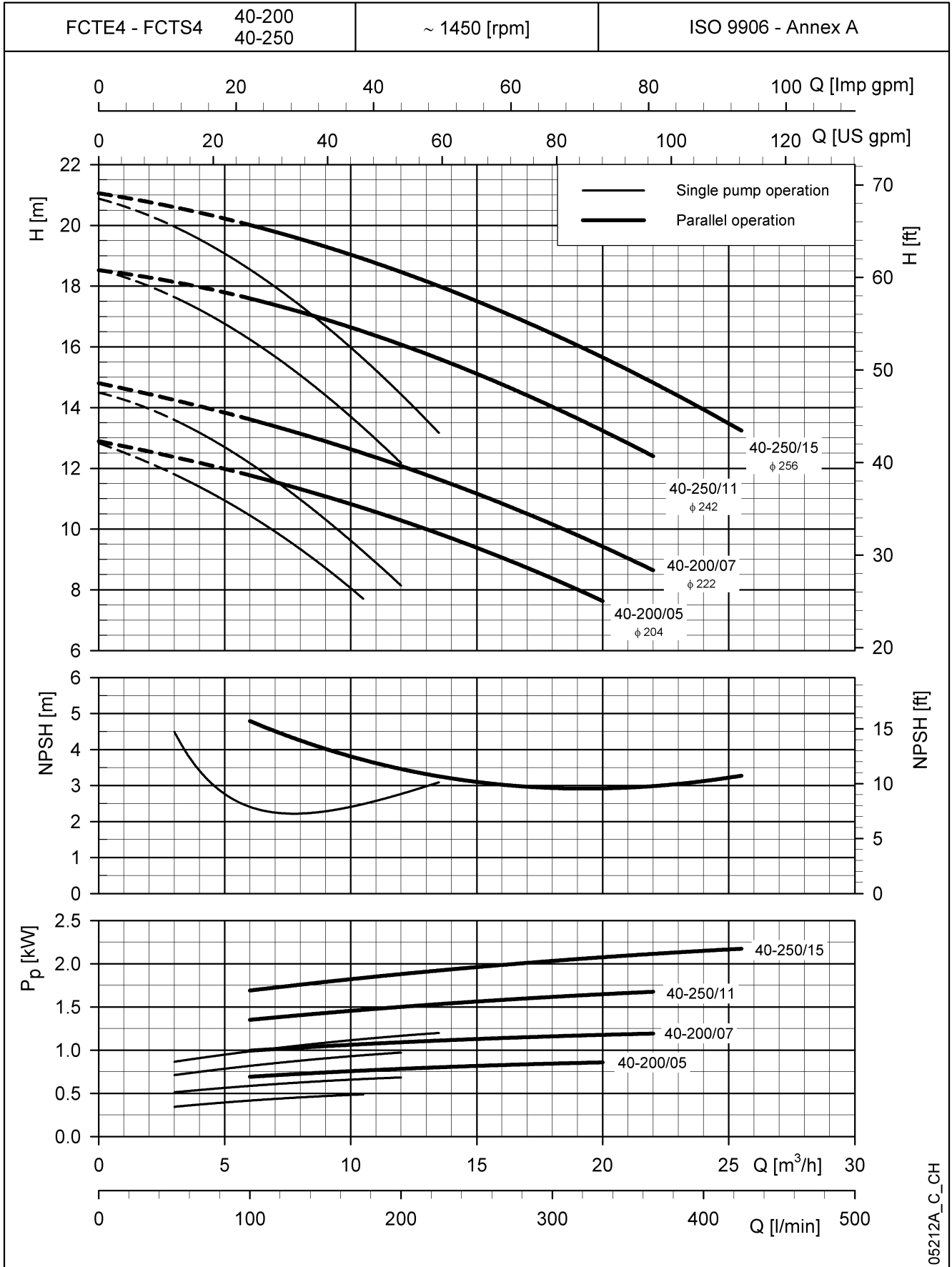
**FCTE4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



05211A_B_CH

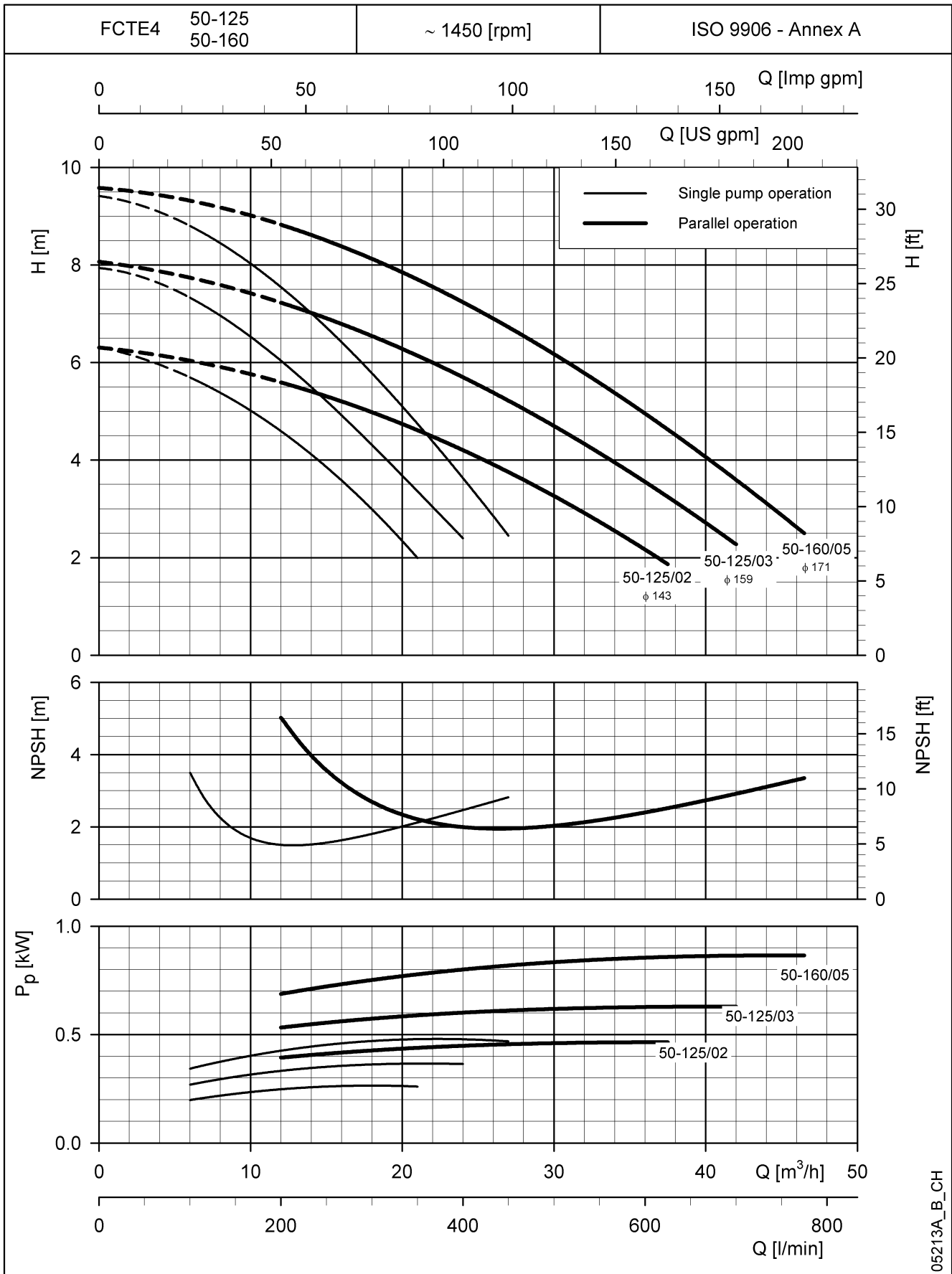
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE4-FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



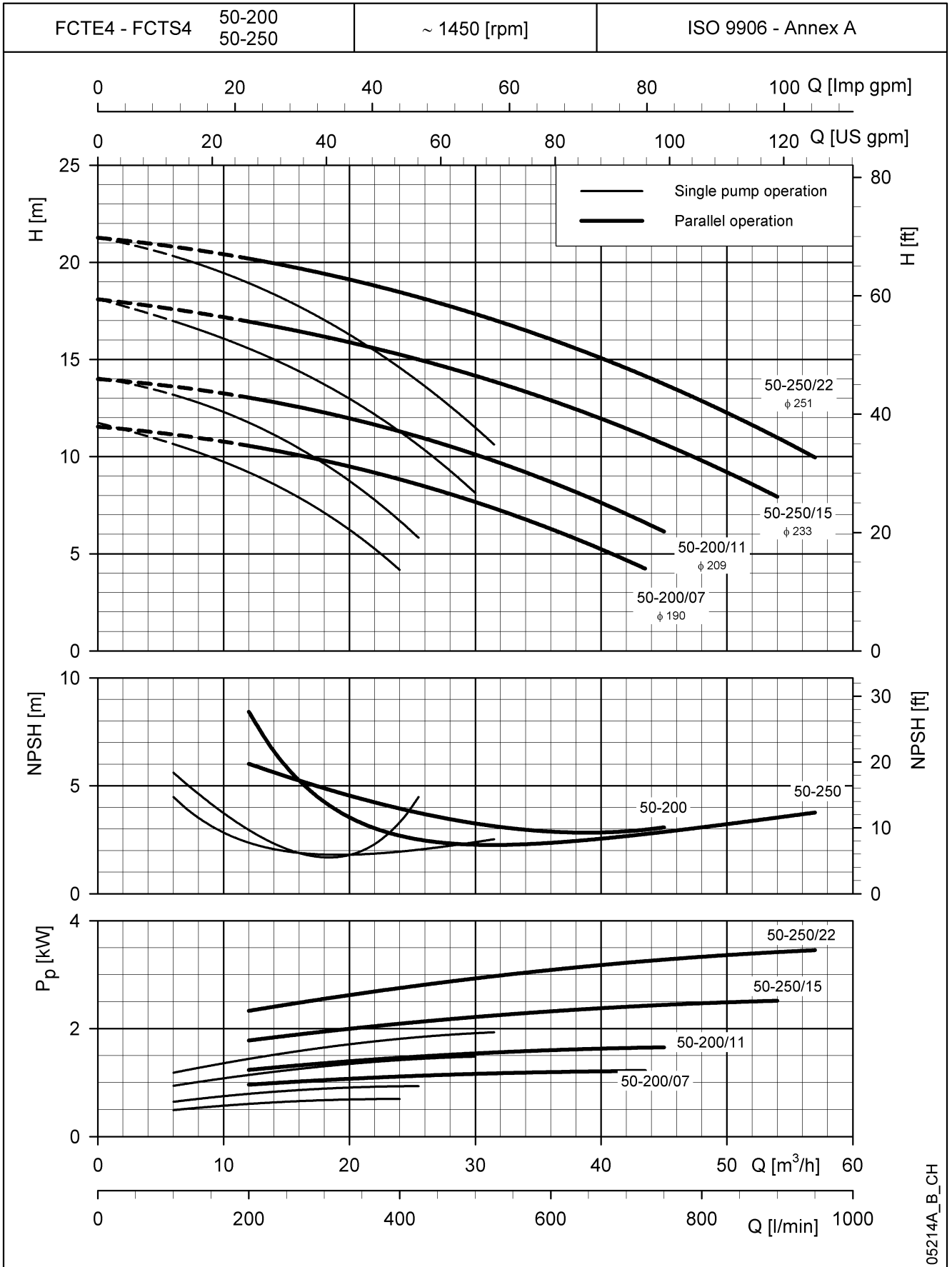
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



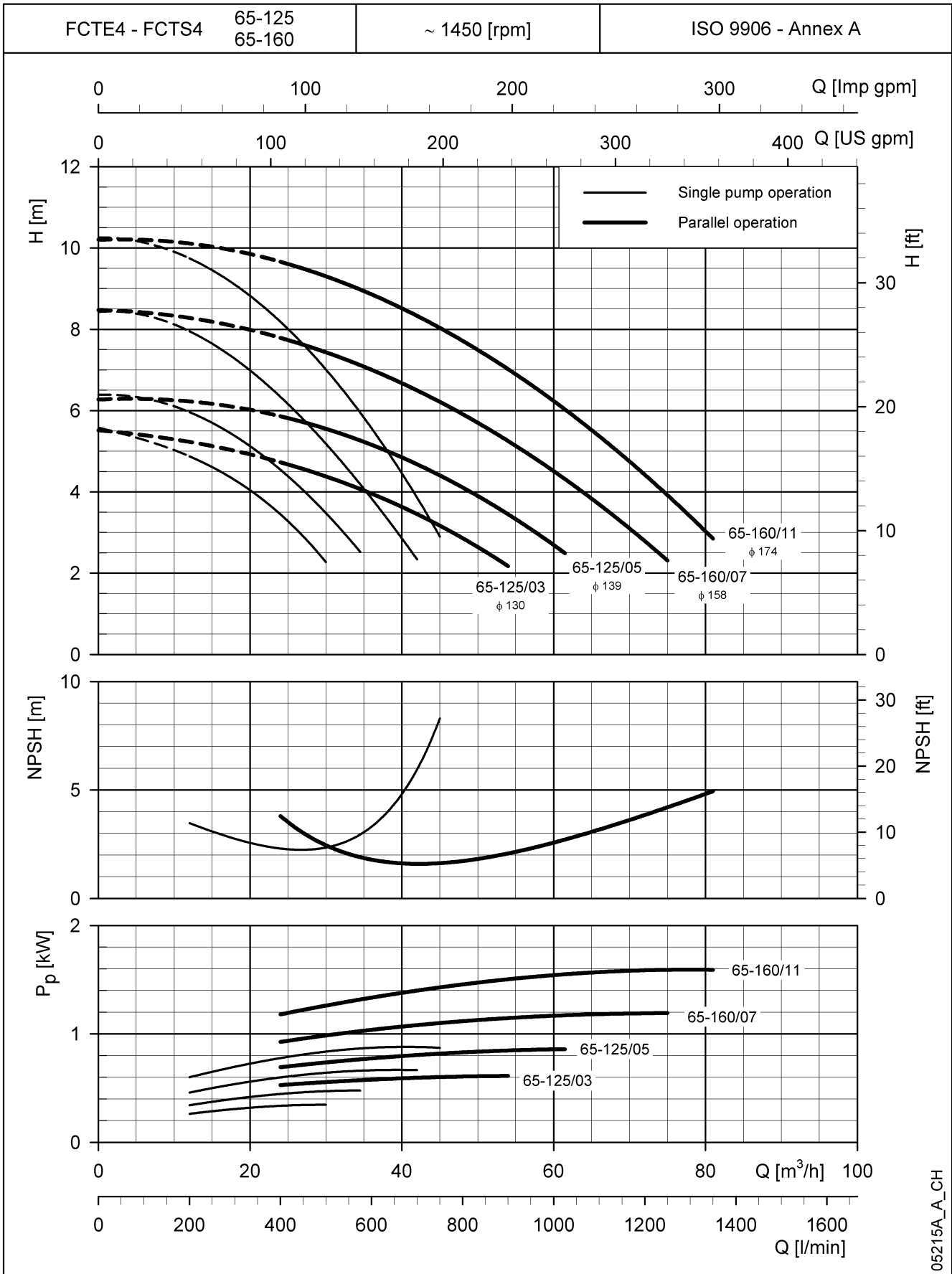
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The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE4-FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



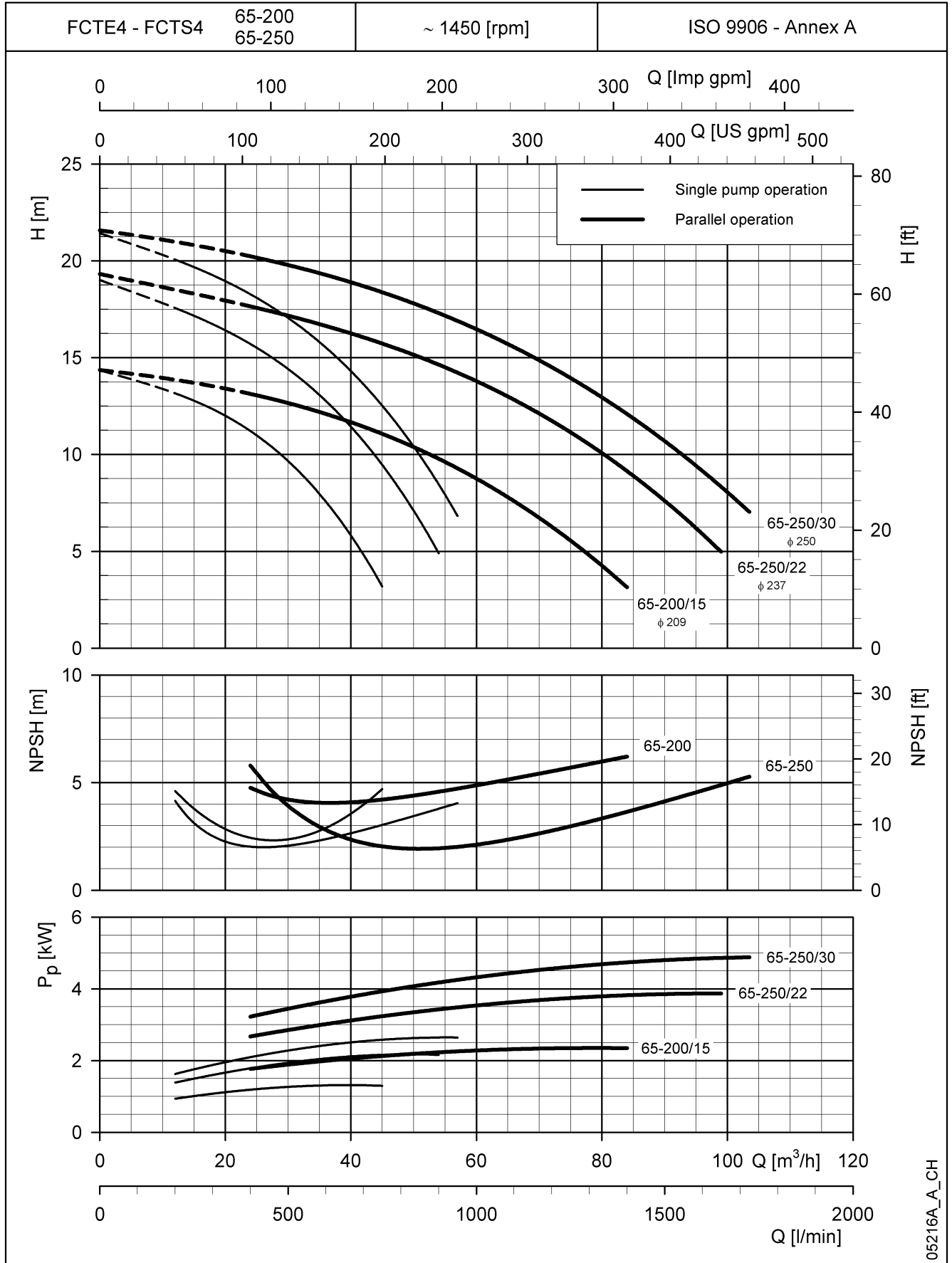
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE4-FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



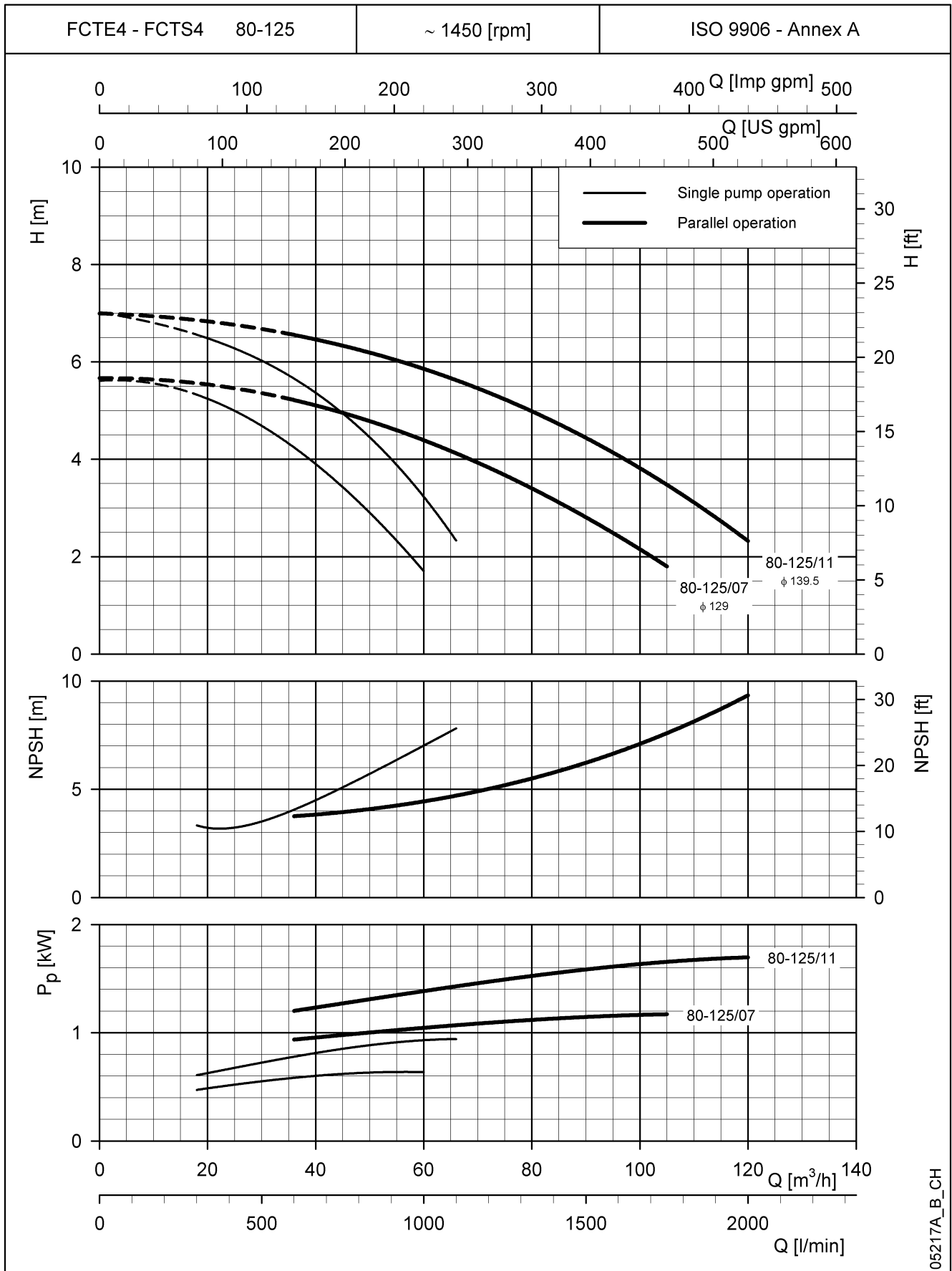
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The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE4-FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



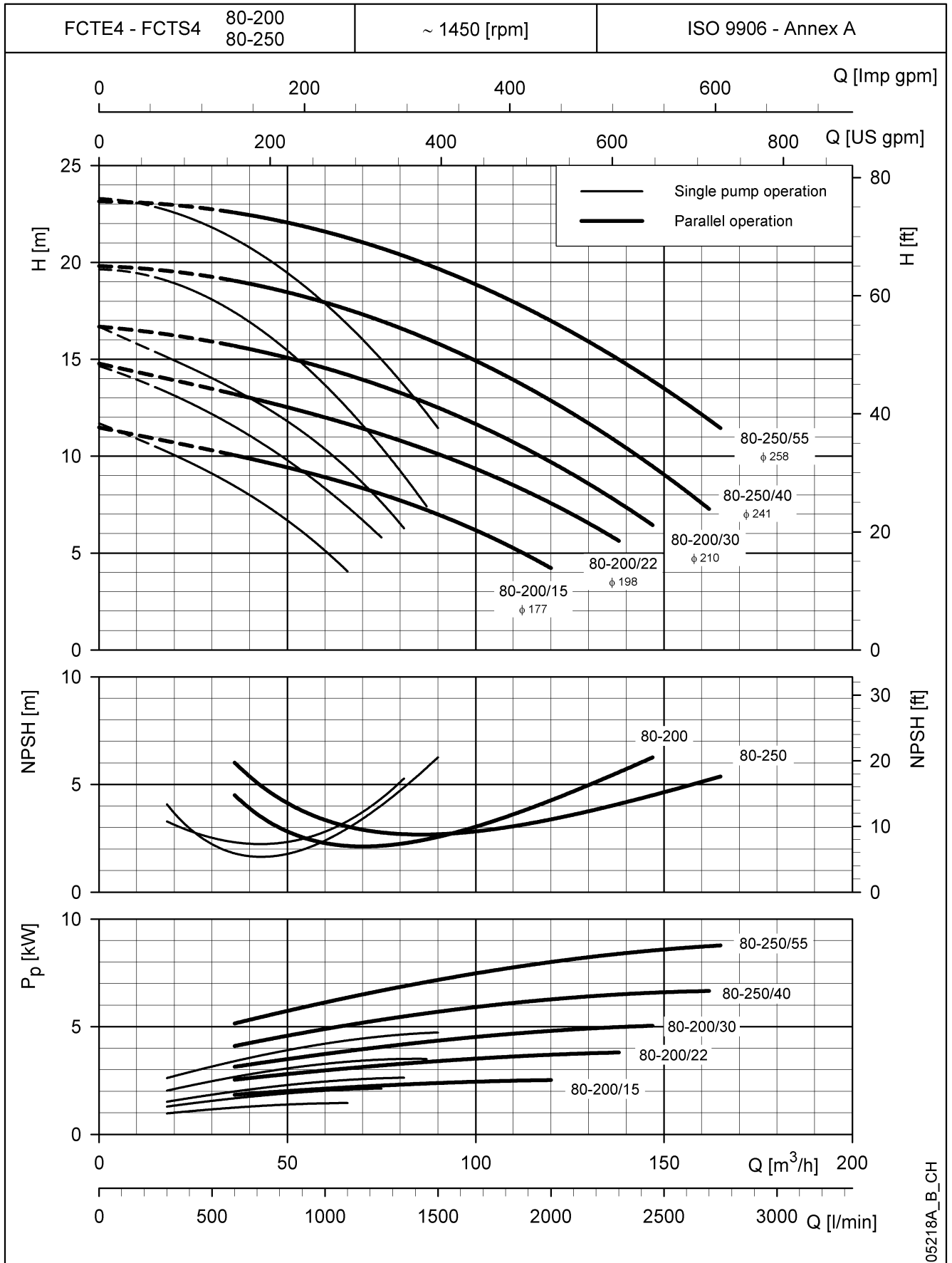
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
 The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE4-FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



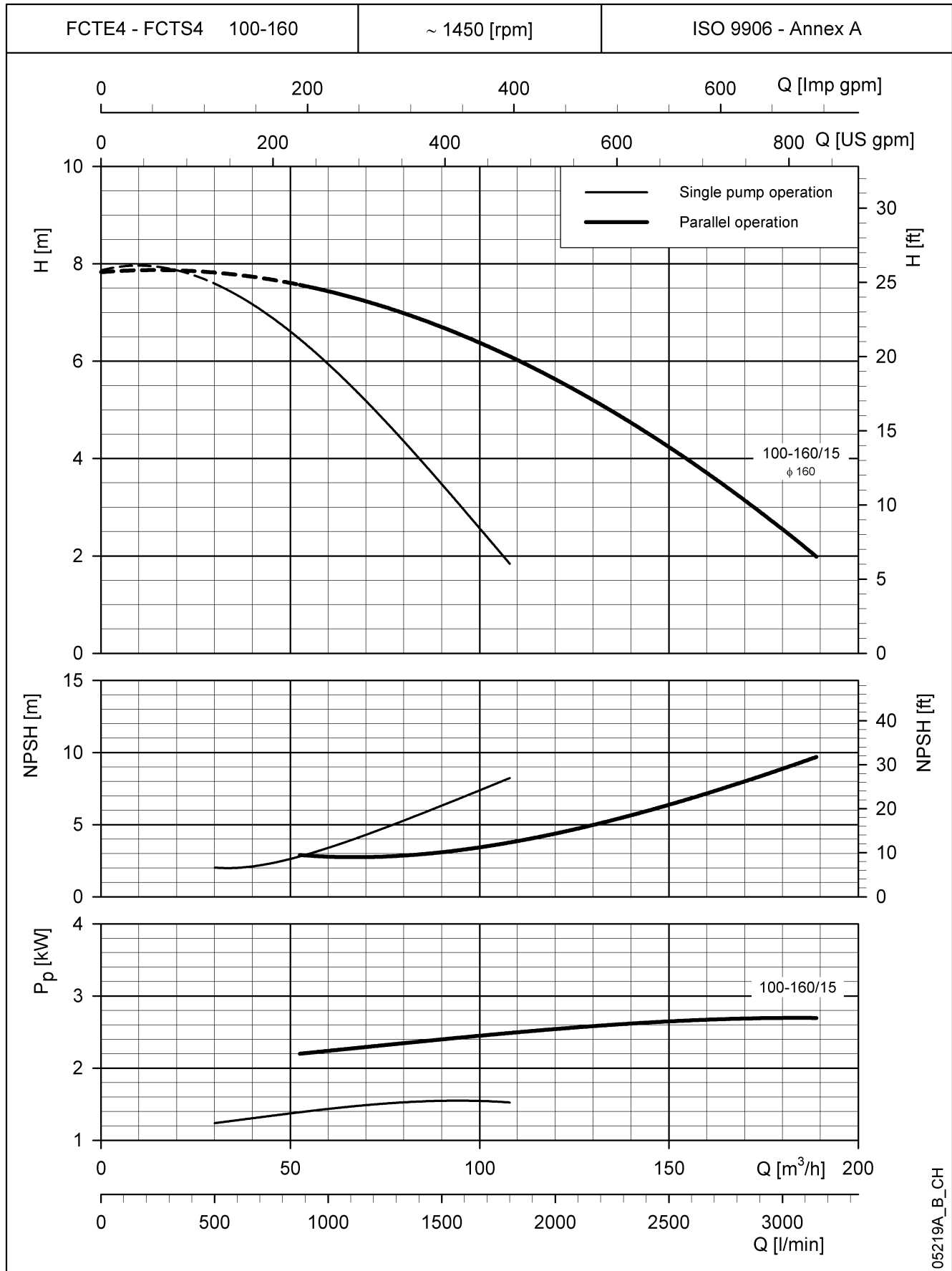
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE4-FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



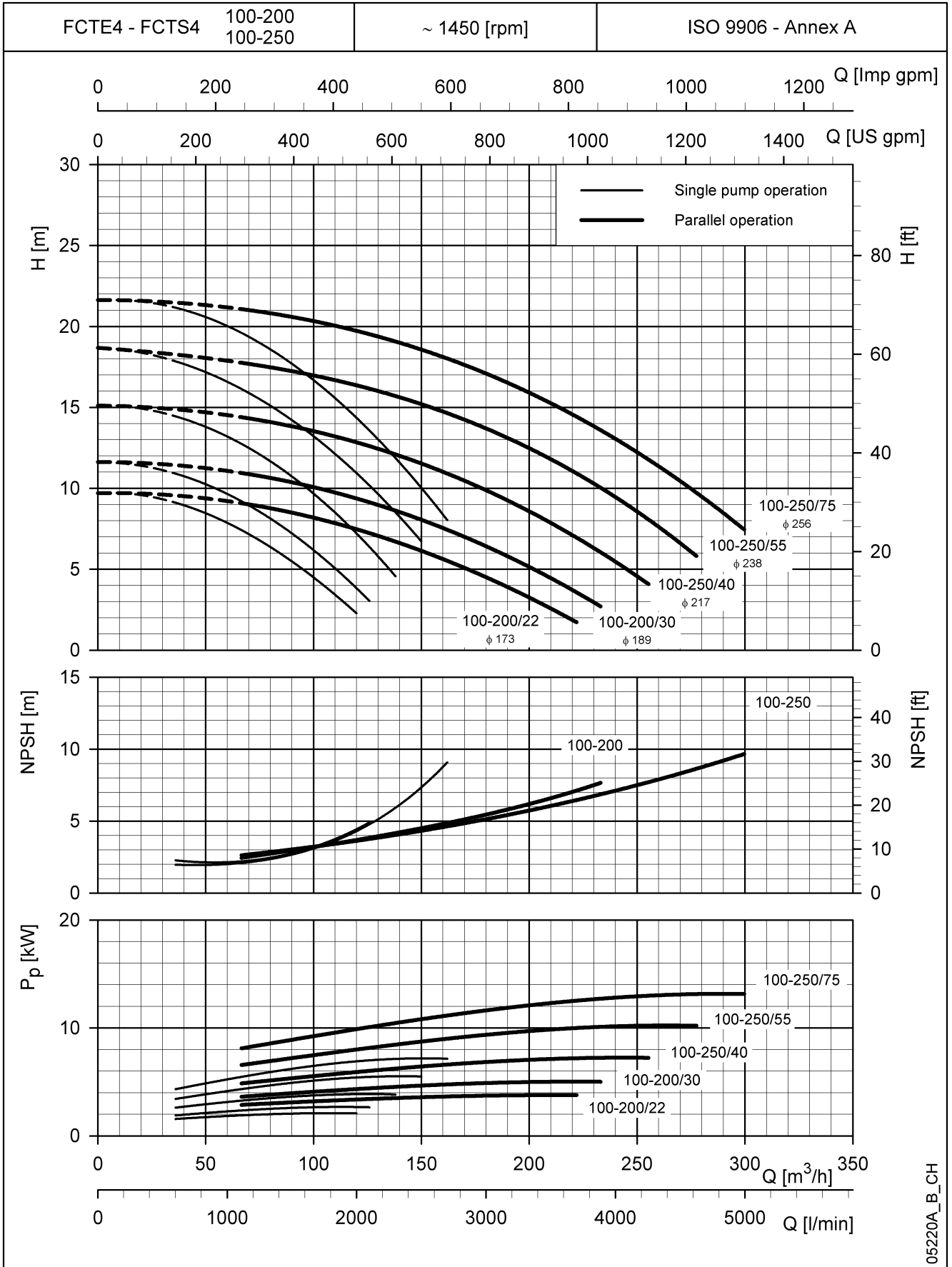
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTE4-FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

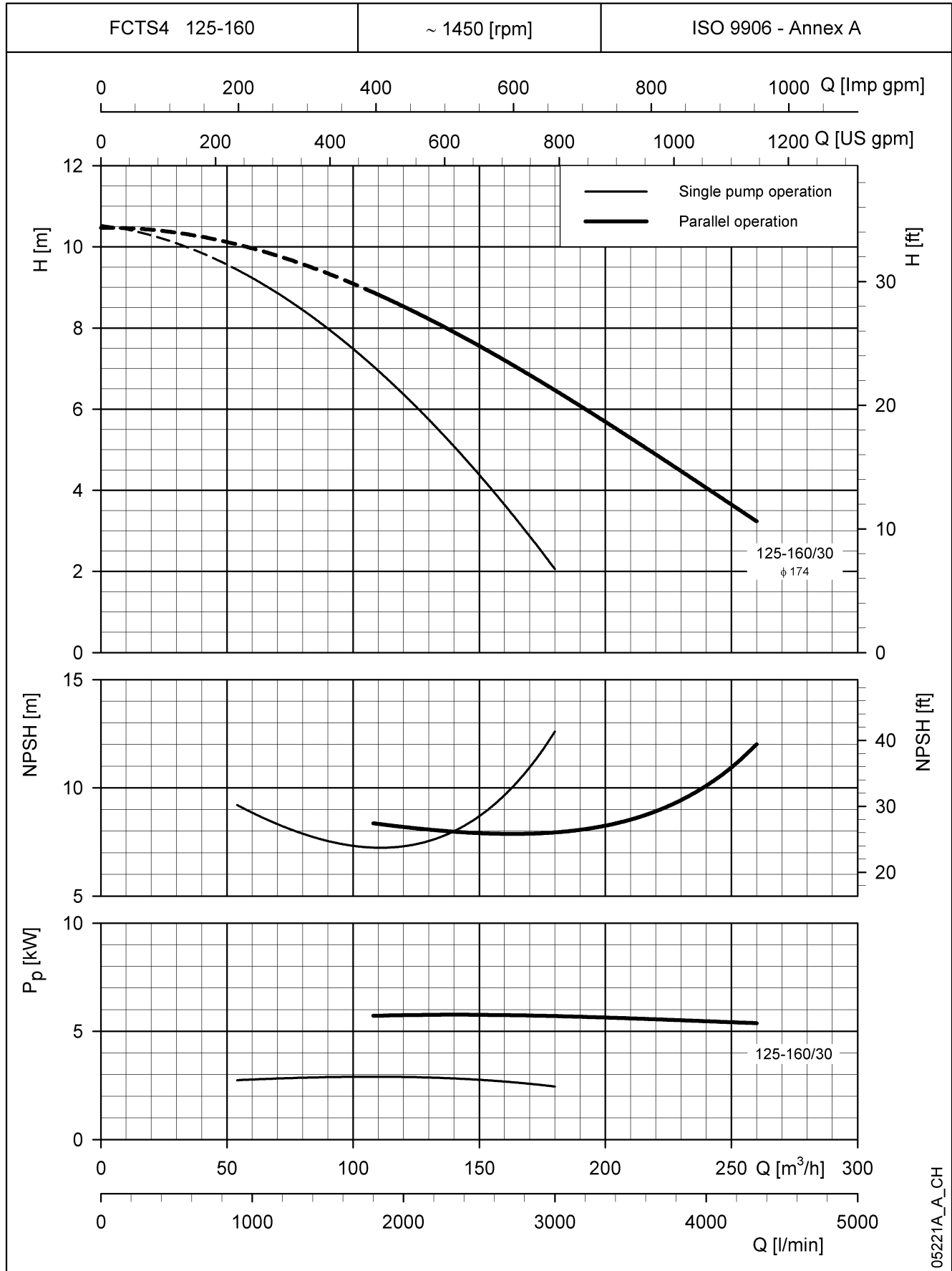
**FCTE4-FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



05220A_B_CH

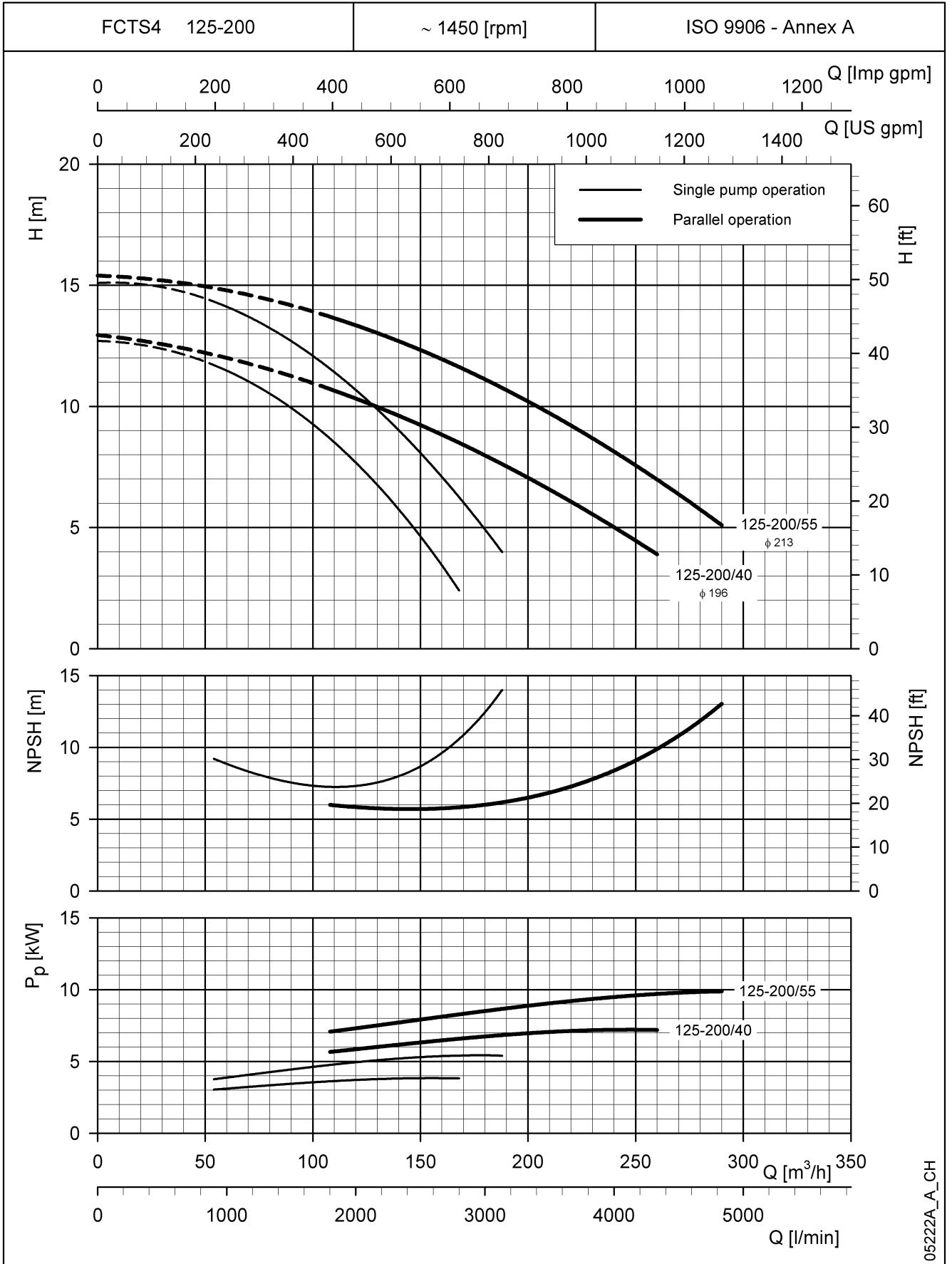
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



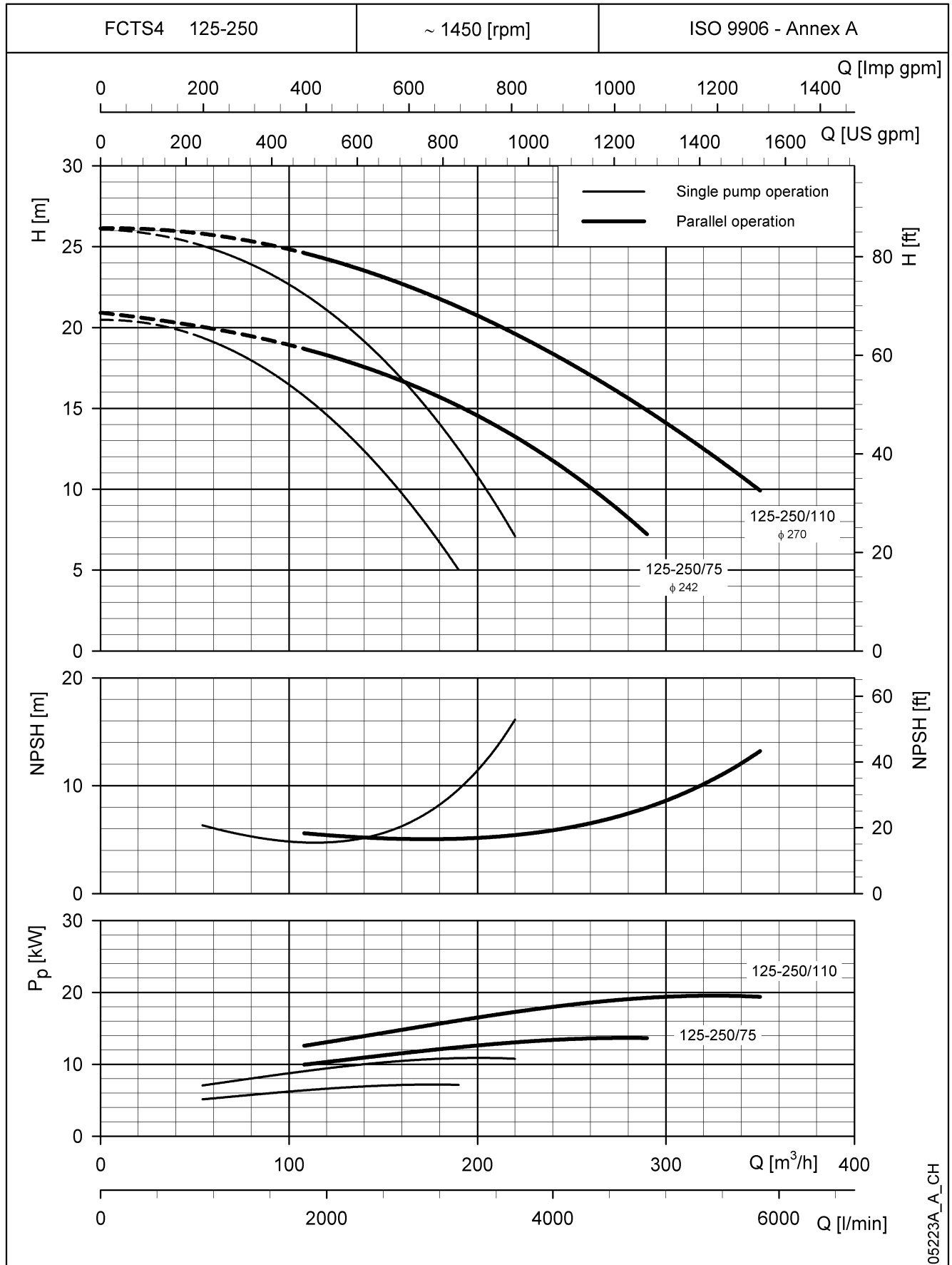
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



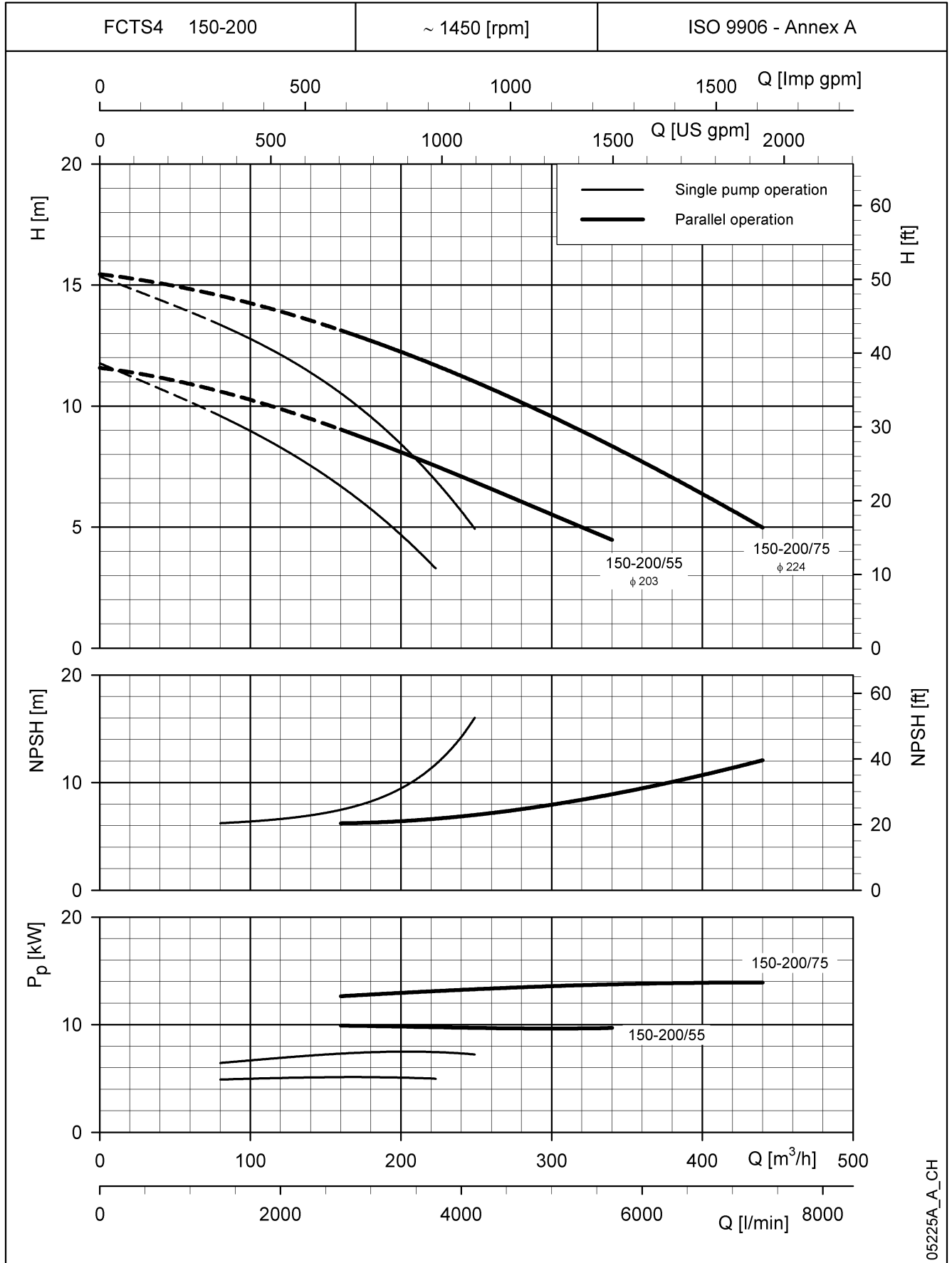
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The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

**FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



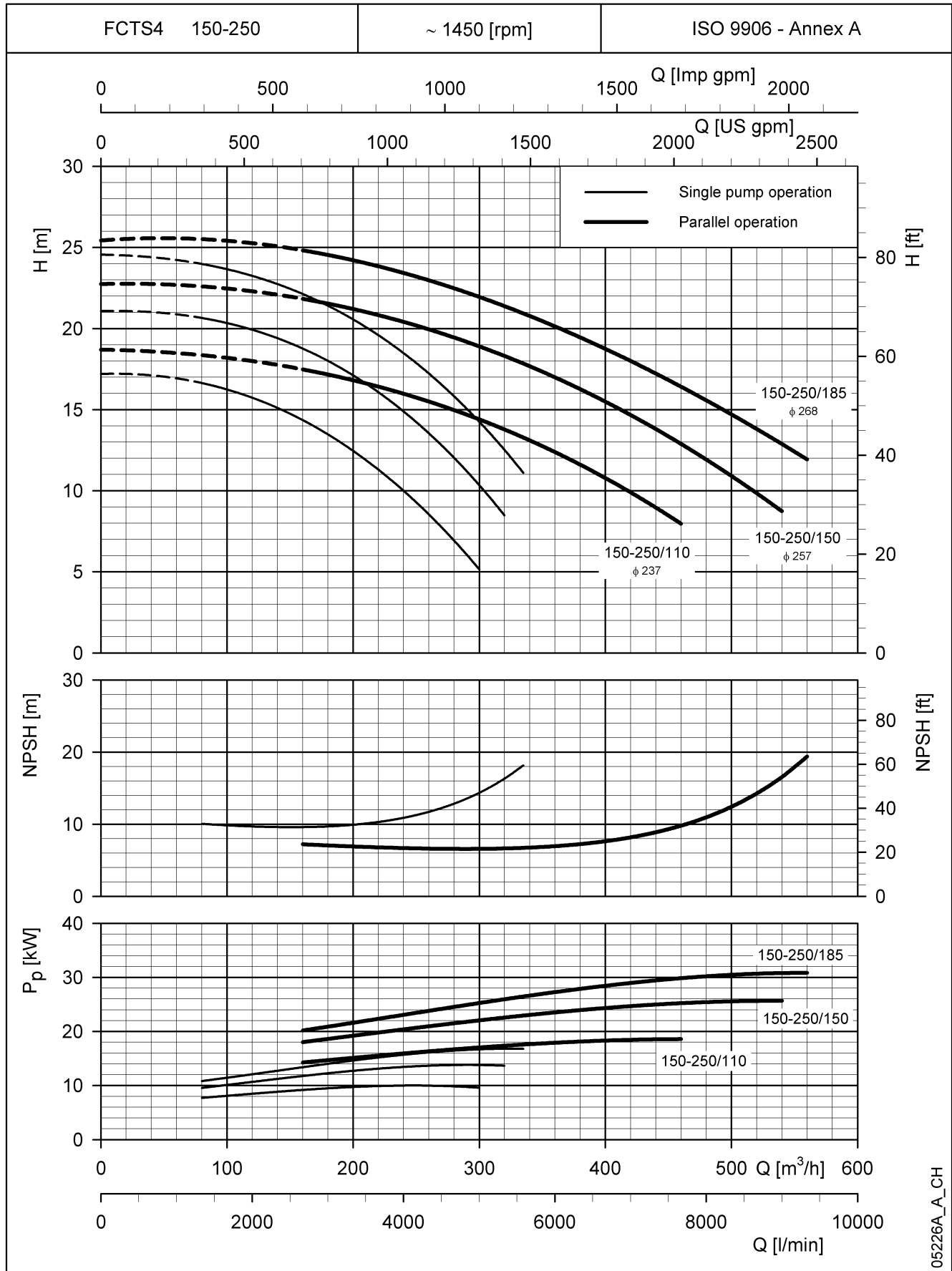
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**FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

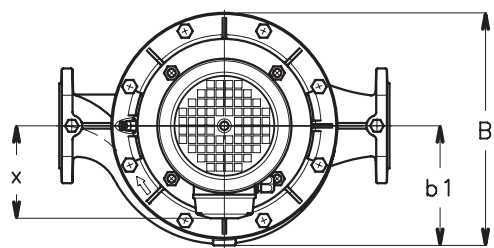
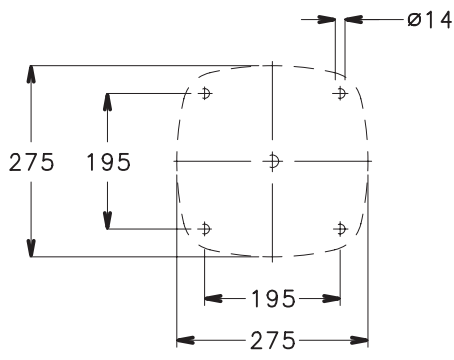
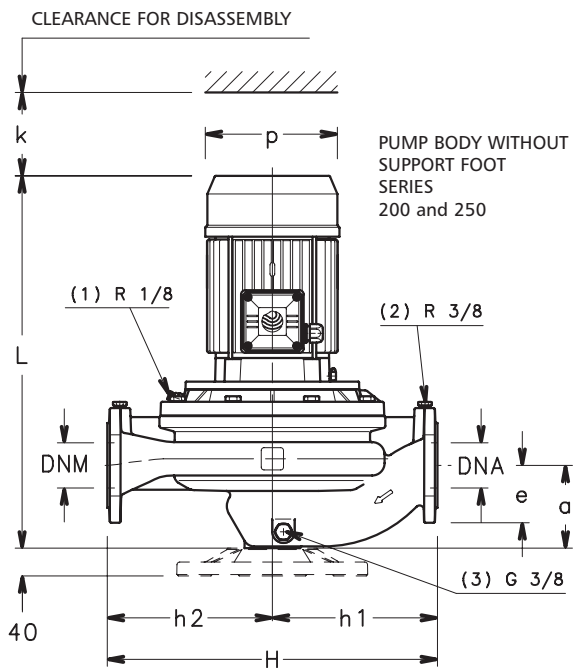
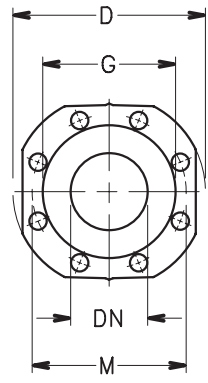
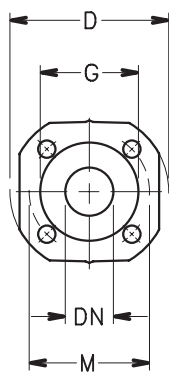
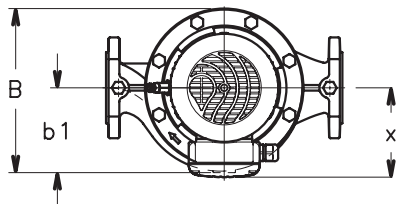
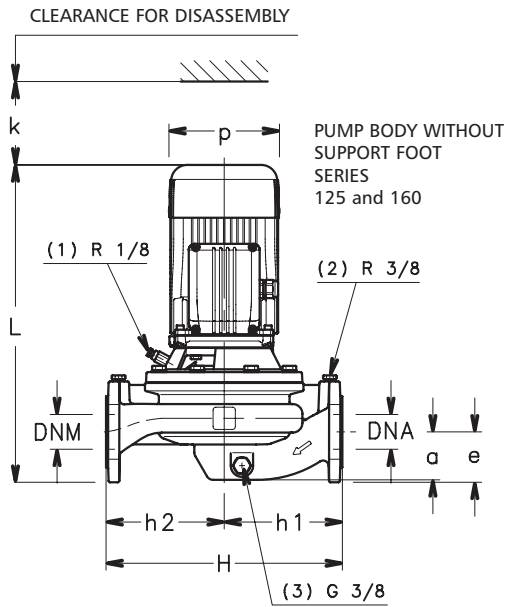
**FCTS4 SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 4 POLES**



The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5 m.
The declared performances are valid for liquids with density $\rho = 1,0 \text{ kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{s}$.

DIMENSIONS AND WEIGHTS

**FCE SERIES
DIMENSIONS AND WEIGHTS**



PUMP FLANGES

DN	D	M	G	HOLES		THICKNESS MAX.
				Nº	DIA.	
40	150	110	88	4	18	18
50	165	125	102	4	18	20
65	185	145	122	4	18	20
80	200	160	138	8	18	22
100	220	180	158	8	18	22

- (1) R 1/8 AIR VALVE
- (2) R 3/8 PRESSURE GAUGE CONNECTOR
- (3) G 3/8 DRAIN

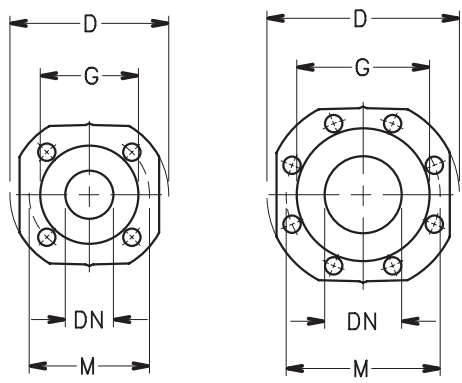
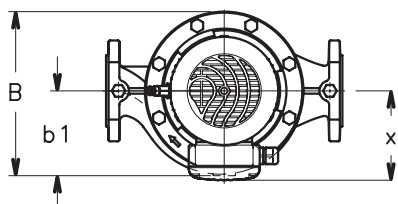
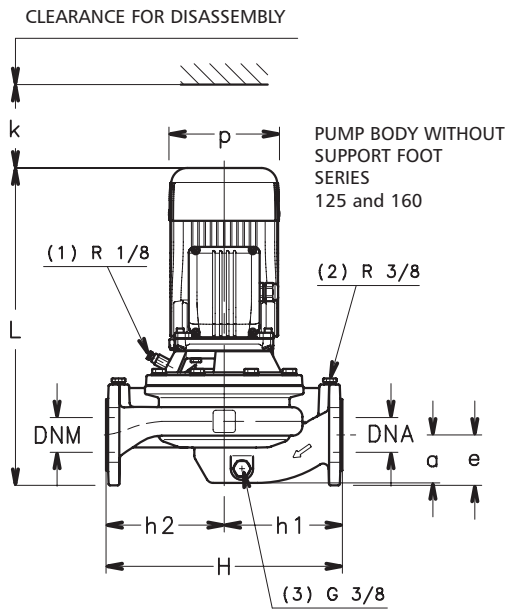
04804D_B_DD

FCE SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	DIMENSIONS (mm)													WEIGHT
	DNA	DNM	a	e	h1	h2	x	b1	p	B	H max	L	k	kg
FCE 40-125/07	40	40	70	70	160	160	129	116	155	243	320	448	86	27
FCE 40-125/11	40	40	70	70	160	160	129	116	155	243	320	448	86	28
FCE 40-160/15	40	40	70	70	160	160	129	116	155	243	320	448	86	29
FCE 40-160/22	40	40	70	70	160	160	129	116	155	243	320	448	86	30
FCE 40-200/40A	40	40	95	65	220	220	133	163	193	325	440	502	98	67
FCE 40-200/40	40	40	95	65	220	220	133	163	193	325	440	502	98	67
FCE 40-200/55	40	40	95	65	220	220	151	163	220	325	440	548	98	70
FCE 40-250/75	40	40	95	65	220	220	151	163	220	325	440	548	98	76
FCE 40-250/110	40	40	95	65	220	220	194	163	257	354	440	599	98	87
FCE 50-125/11	50	50	69	73	170	170	129	122	155	243	340	457	88	30
FCE 50-125/15	50	50	69	73	170	170	129	122	155	243	340	457	88	33
FCE 50-160/22	50	50	69	73	170	170	129	122	155	243	340	457	88	39
FCE 50-160/30	50	50	69	73	170	170	121	122	176	236	340	475	88	42
FCE 50-160/40	50	50	69	73	170	170	133	122	193	247	340	501	88	44
FCE 50-200/55	50	50	110	73	220	220	151	163	220	326	440	577	100	53
FCE 50-200/75	50	50	110	73	220	220	151	163	220	326	440	577	100	57
FCE 50-250/92	50	50	110	73	220	220	194	163	257	354	440	628	100	96
FCE 50-250/110	50	50	110	73	220	220	194	163	257	354	440	628	100	102
FCE 50-250/150	50	50	110	73	220	220	244	163	310	395	440	712	100	110
FCE 65-125/22	65	65	77	83	170	170	129	137	155	274	340	476	92	49
FCE 65-125/30	65	65	77	83	170	170	121	137	176	274	340	494	92	53
FCE 65-125/40	65	65	77	83	170	170	133	137	193	274	340	520	92	56
FCE 65-160/55	65	65	77	83	170	170	151	137	220	288	340	566	92	66
FCE 65-160/75	65	65	77	83	170	170	151	137	220	288	340	566	92	71
FCE 65-200/92	65	65	119	83	237,5	237,5	194	172	257	354	475	633	104	100
FCE 65-200/110	65	65	119	83	237,5	237,5	194	172	257	354	475	633	104	107
FCE 65-250/150	65	65	119	83	237,5	237,5	244	172	310	395	475	717	104	123
FCE 65-250/185	65	65	119	83	237,5	237,5	244	172	310	395	475	761	104	130
FCE 65-250/220	65	65	119	83	237,5	237,5	244	172	310	395	475	761	104	138
FCE 80-125/30	80	80	90	90	175	185	121	148	176	287	360	528	102	60
FCE 80-125/40	80	80	90	90	175	185	133	148	193	287	360	554	102	62
FCE 80-125/55	80	80	90	90	175	185	151	148	220	290	360	600	102	66
FCE 80-160/75	80	80	90	90	175	185	151	148	220	290	360	600	102	70
FCE 80-200/110	80	80	130	90	250	250	194	184	257	354	500	660	112	115
FCE 80-200/150	80	80	130	90	250	250	144	184	310	395	500	744	112	125
FCE 80-200/185	80	80	130	90	250	250	244	184	310	395	500	788	112	140
FCE 80-200/220	80	80	130	90	250	250	244	184	310	395	500	788	112	150
FCE 100-160/110	100	100	105	105	225	225	194	172	257	330	450	675	117	122
FCE 100-200/185	100	100	140	105	275	275	244	196	310	398	550	809	129	181
FCE 100-200/220	100	100	140	105	275	275	244	196	310	398	550	809	129	190

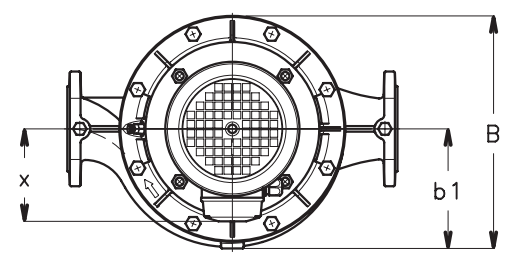
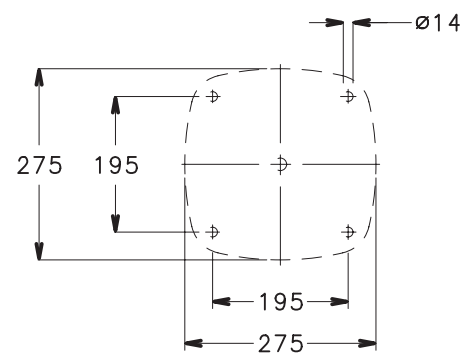
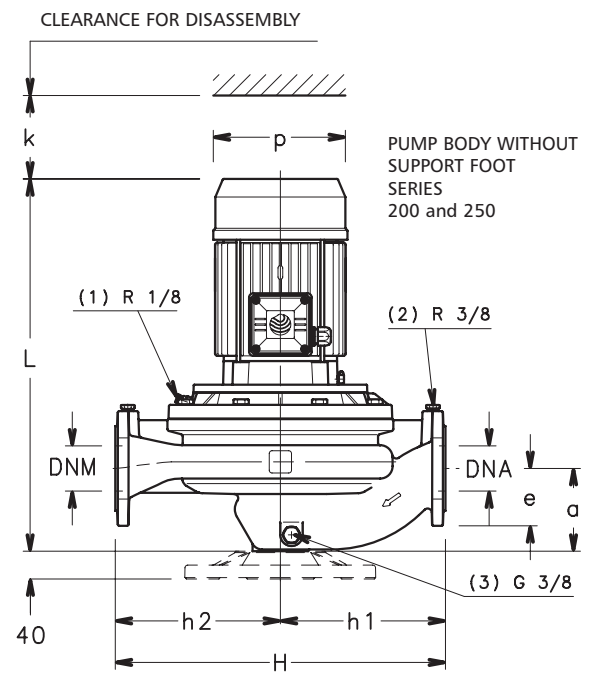
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**FCE4 SERIES
DIMENSIONS AND WEIGHTS**



PUMP FLANGES

DN	D	M	G	HOLES		THICKNESS MAX.
				Nº	D I A.	
40	150	110	88	4	18	18
50	165	125	102	4	18	20
65	185	145	122	4	18	20
80	200	160	138	8	18	22
100	220	180	158	8	18	22



- (1) R 1/8 AIR VALVE
- (2) R 3/8 PRESSURE GAUGE CONNECTOR
- (3) G 3/8 DRAIN

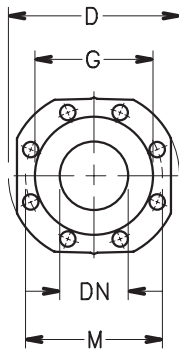
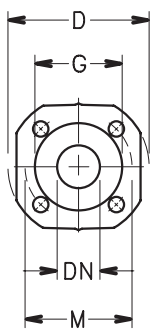
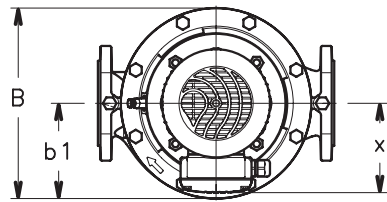
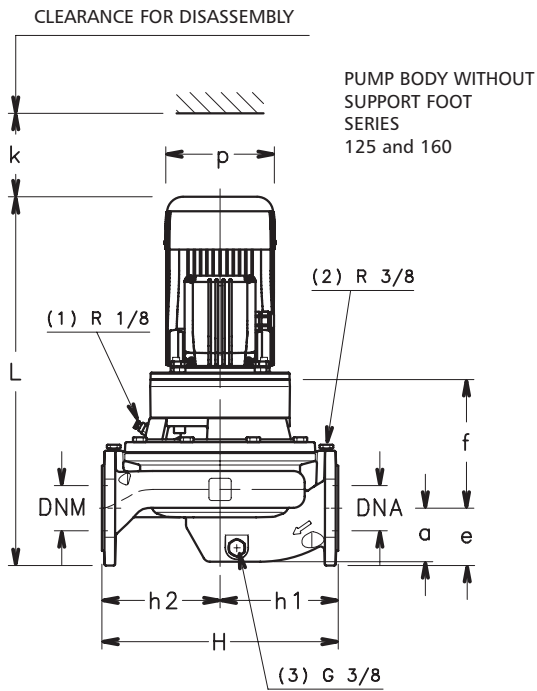
04804D_B_DD

FCE4 SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	DIMENSIONS (mm)													WEIGHT kg
	DNA	DNM	a	e	h1	h2	x	b1	p	B	H max	L	k	
FCE4 40-125/02A	40	40	70	70	160	160	121	116	140	235	320	416	86	24
FCE4 40-125/02A	40	40	70	70	160	160	121	116	140	235	320	416	86	24
FCE4 40-160/02	40	40	70	70	160	160	121	116	140	235	320	416	86	25
FCE4 40-160/03	40	40	70	70	160	160	121	116	140	235	320	416	86	26
FCE4 40-200/05	40	40	95	65	220	220	129	163	155	325	440	458	98	44
FCE4 40-200/07	40	40	95	65	220	220	129	163	155	325	440	458	98	44
FCE4 40-250/11	40	40	95	65	220	220	121	163	176	325	440	476	98	58
FCE4 40-250/15	40	40	95	65	220	220	121	163	176	325	440	476	98	59
FCE4 50-125/02	50	50	69	73	170	170	121	122	140	236	340	425	88	28
FCE4 50-125/03	50	50	69	73	170	170	121	122	140	236	340	425	88	29
FCE4 50-160/05	50	50	69	73	170	170	129	122	155	243	340	457	88	31
FCE4 50-200/07	50	50	110	73	220	220	129	163	155	326	440	487	100	53
FCE4 50-200/11	50	50	110	73	220	220	121	163	176	326	440	505	100	57
FCE4 50-250/15	50	50	110	73	220	220	121	163	176	326	440	505	100	60
FCE4 50-250/22	50	50	110	73	220	220	133	163	193	326	440	531	100	63
FCE4 65-125/03	65	65	77	83	170	170	121	137	140	274	340	444	92	38
FCE4 65-125/05	65	65	77	83	170	170	129	137	155	274	340	476	92	42
FCE4 65-160/07	65	65	77	83	170	170	129	137	155	274	340	476	92	46
FCE4 65-160/11	65	65	77	83	170	170	121	137	176	274	340	494	92	48
FCE4 65-200/15	65	65	119	83	237,5	237,5	121	172	176	335	475	510	104	63
FCE4 65-250/22	65	65	119	83	237,5	237,5	133	172	193	335	475	536	104	71
FCE4 65-250/30	65	65	119	83	237,5	237,5	133	172	193	335	475	536	104	73
FCE4 80-125/07	80	80	90	90	175	185	129	148	155	287	360	510	102	50
FCE4 80-125/11	80	80	90	90	175	185	121	148	176	287	360	528	102	53
FCE4 80-200/15	80	80	130	90	250	250	121	184	176	347	500	537	112	75
FCE4 80-200/22	80	80	130	90	250	250	133	184	193	347	500	563	112	78
FCE4 80-200/30	80	80	130	90	250	250	133	184	193	347	500	563	112	82
FCE4 80-250/40	80	80	130	90	250	250	151	184	220	347	500	586	112	97
FCE4 80-250/55	80	80	130	90	250	250	194	184	257	354	500	622	112	106
FCE4 100-160/15	100	100	105	105	225	225	121	172	176	311	450	552	117	68
FCE4 100-200/22	100	100	140	105	275	275	133	196	193	362	550	584	129	90
FCE4 100-200/30	100	100	140	105	225	275	133	196	193	362	550	584	129	92
FCE4 100-250/40	100	100	140	105	275	275	151	196	220	362	550	607	129	105
FCE4 100-250/55	100	100	140	105	275	275	194	196	257	362	550	643	129	112
FCE4 100-250/75	100	100	140	105	275	275	194	196	257	362	550	681	129	128

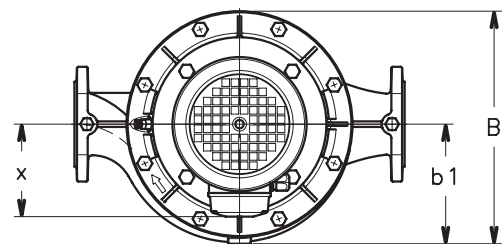
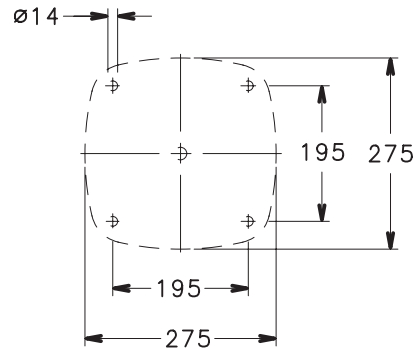
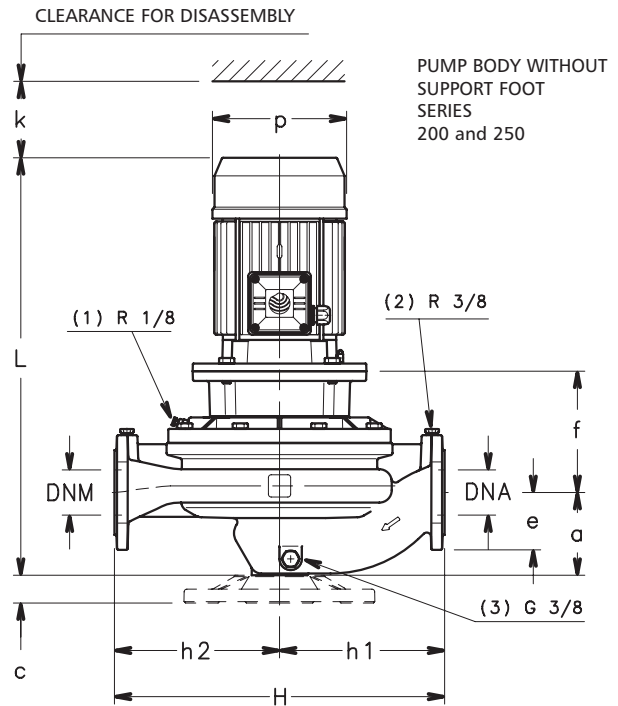
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**FCS SERIES
DIMENSIONS AND WEIGHTS**



PUMP FLANGES

DN	D	M	G	HOLES		THICKNESS MAX.
				N°	DIA.	
40	150	110	88	4	18	18
50	165	125	102	4	18	20
65	185	145	122	4	18	20
80	200	160	138	8	18	22
100	220	180	158	8	18	22



- (1) R 1/8 AIR VALVE
- (2) R 3/8 PRESSURE GAUGE CONNECTOR
- (3) G 3/8 DRAIN

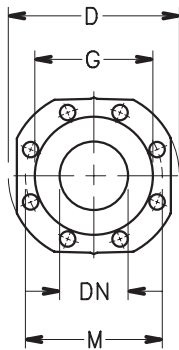
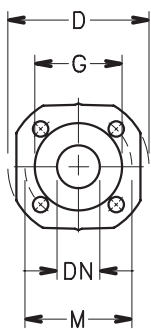
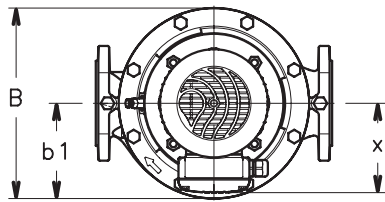
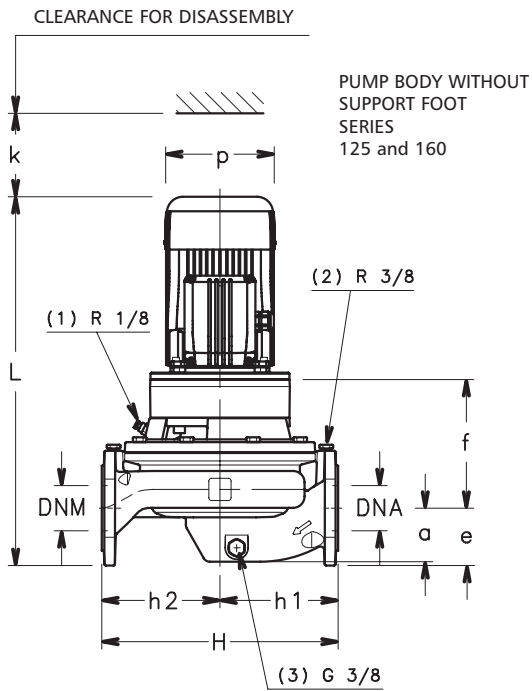
04854D_B_DD

FCS SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	DIMENSIONS (mm)														WEIGHT
	DNA	DNM	a	e	f	h1	h2	x	b1	p	B	H max	L	k	kg
FCS 40-125/07	40	40	70	70	170	160	160	121	116	140	235	320	466	86	30
FCS 40-125/11	40	40	70	70	170	160	160	129	116	155	243	320	503	86	31
FCS 40-160/15	40	40	70	70	170	160	160	129	116	155	243	320	503	86	32
FCS 40-160/22	40	40	70	70	170	160	160	129	116	155	243	320	503	86	34
FCS 40-200/30	40	40	95	65	165	220	220	121	163	176	325	440	563	98	65
FCS 40-200/40	40	40	95	65	165	220	220	133	163	193	325	440	567	98	70
FCS 40-200/55	40	40	95	65	192	220	220	151	163	220	325	440	661	98	85
FCS 40-250/75	40	40	95	65	192	220	220	151	163	220	325	440	661	98	91
FCS 40-250/110	40	40	95	65	222	220	220	194	163	257	366	440	744	98	115
FCS 50-125/11	50	50	69	73	176	170	170	129	122	155	243	340	512	88	35
FCS 50-125/15	50	50	69	73	176	170	170	129	122	155	243	340	512	88	37
FCS 50-160/22	50	50	69	73	176	170	170	129	122	155	243	340	512	88	45
FCS 50-160/30	50	50	69	73	186	170	170	121	122	176	247	340	562	88	47
FCE 50-160/40	50	50	69	73	186	170	170	133	122	193	258	340	566	88	53
FCS50-200/55	50	50	110	73	206	220	220	151	163	220	326	440	690	100	88
FCS 50-200/75	50	50	110	73	206	220	220	151	163	220	326	440	690	100	93
FCS 50-250/110A	50	50	110	73	236	220	220	194	163	257	366	440	773	100	110
FCS 50-250/110	50	50	110	73	236	220	220	194	163	257	366	440	773	100	110
FCS 50-250/150	50	50	110	73	236	220	220	244	163	310	407	440	834	100	120
FCS 65-125/22	65	65	77	83	185	170	170	129	137	155	274	340	531	92	64
FCS 65-125/30	65	65	77	83	195	170	170	121	137	176	274	340	581	92	58
FCS 65-125/40	65	65	77	83	195	170	170	133	137	193	274	340	585	92	62
FCS 65-160/55	65	65	77	83	222	170	170	151	137	220	301	340	679	92	77
FCS 65-160/75	65	65	77	83	222	170	170	151	137	220	301	340	679	92	80
FCS 65-200/110A	65	65	119	83	232	237,5	237,5	194	172	257	366	475	778	104	128
FCS 65-200/110	65	65	119	83	232	237,5	237,5	194	172	257	366	475	778	104	128
FCS 65-250/150	65	65	119	83	232	237,5	237,5	244	172	310	407	475	839	104	129
FCS 65-250/185	65	65	119	83	232	237,5	237,5	244	172	310	407	475	883	104	140
FCE 65-250/220	65	65	119	83	232	237,5	237,5	244	172	310	407	475	883	104	148
FCS 80-125/30	80	80	90	90	222	175	185	121	148	176	287	360	615	102	78
FCS 80-125/40	80	80	90	90	222	175	185	133	148	193	287	360	619	102	78
FCS 80-125/55	80	80	90	90	249	175	185	151	148	220	301	360	713	102	83
FCS 80-160/75	80	80	90	90	249	175	185	151	148	220	301	360	713	102	87
FCS 80-200/110	80	80	130	90	248	250	250	194	184	257	366	500	805	112	125
FCS 80-200/150	80	80	130	90	248	250	250	244	184	310	407	500	866	112	135
FCS 80-200/185	80	80	130	90	248	250	250	244	184	310	407	500	910	112	149
FCS 80-200/220	80	80	130	90	248	250	250	244	184	310	407	500	910	112	160
FCS 100-160/110	100	100	105	105	288	225	225	194	172	257	366	450	820	117	130
FCS 100-200/185	100	100	140	105	259	275	275	244	196	310	407	550	931	129	190
FCS 100-200/220	100	100	140	105	259	275	275	244	196	310	407	550	931	129	200

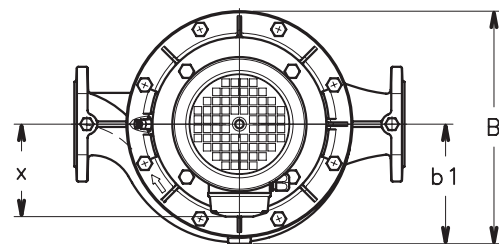
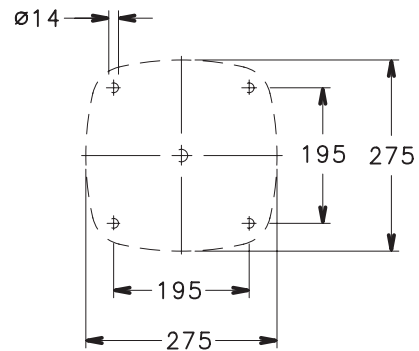
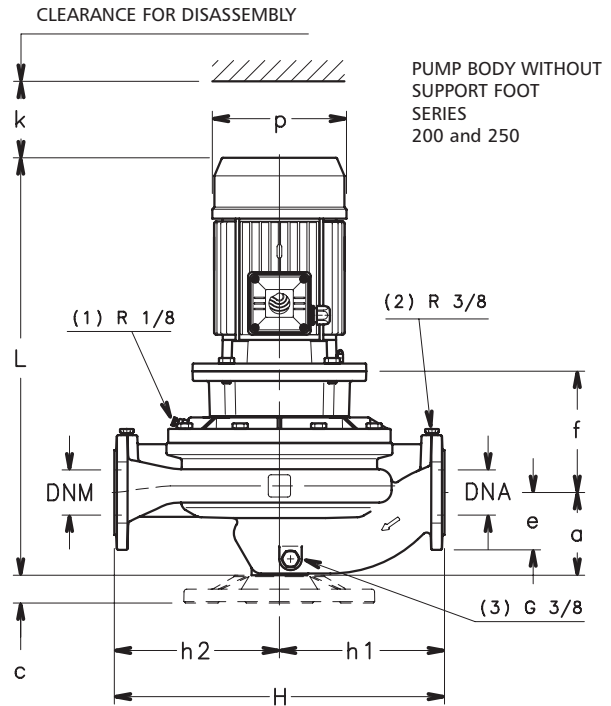
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**FCS4 SERIES
DIMENSIONS AND WEIGHTS**



PUMP FLANGES

DN	D	M	G	HOLES		THICKNESS MAX.
				N°	D I.A.	
40	150	110	88	4	18	18
50	165	125	102	4	18	20
65	185	145	122	4	18	20
80	200	160	138	8	18	22
100	220	180	158	8	18	22



- (1) R 1/8 AIR VALVE
- (2) R 3/8 PRESSURE GAUGE CONNECTOR
- (3) G 3/8 DRAIN

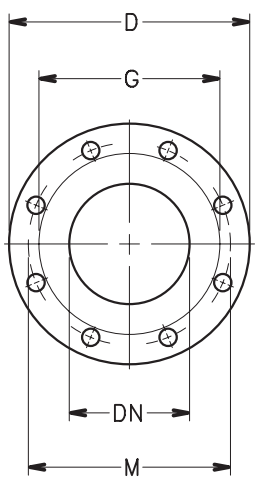
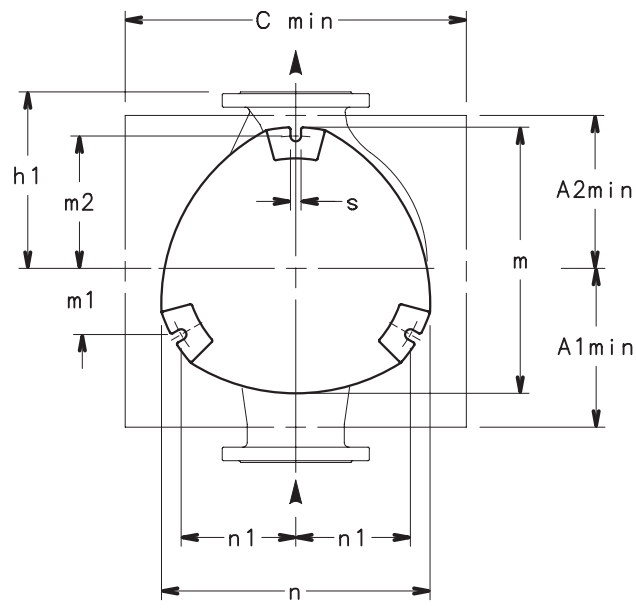
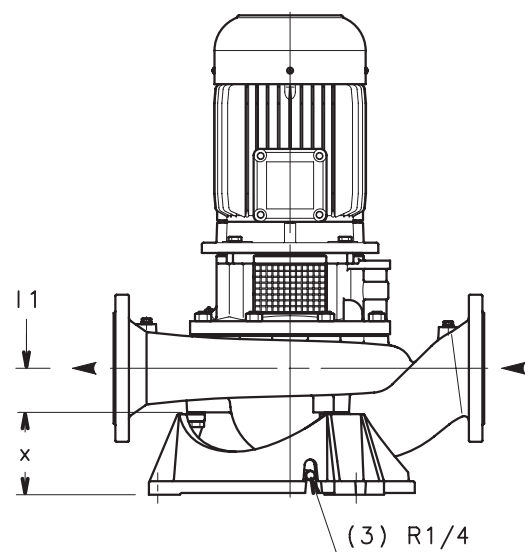
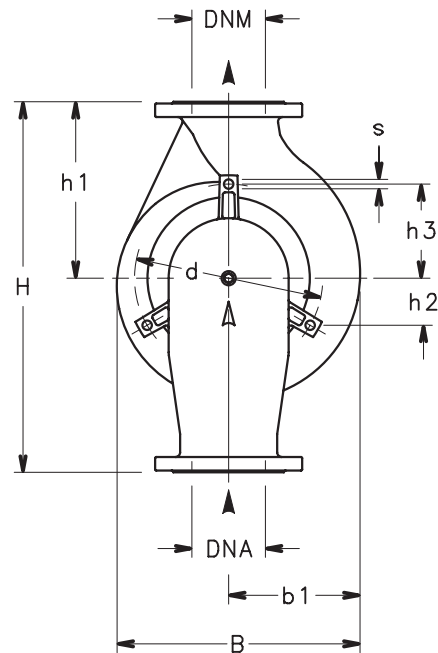
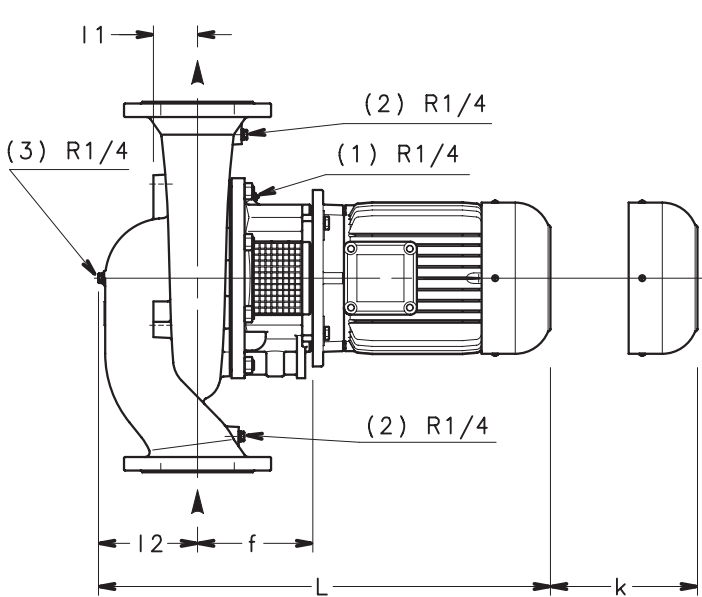
04854D_B_DD

FCS4 SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	DIMENSIONS (mm)														WEIGHT
	DNA	DNM	a	e	f	h1	h2	x	b1	p	B	H max	L	k	kg
FCS4 40-200/05	40	40	95	65	155	220	220	129	163	155	325	440	513	98	56
FCS4 40-200/07	40	40	95	65	155	220	220	129	163	155	325	440	513	98	59
FCS4 40-250/11	40	40	95	65	155	220	220	121	163	176	325	440	531	98	61
FCS4 40-250/15	40	40	95	65	155	220	220	121	163	176	325	440	531	98	63
FCS4 50-200/07	50	50	110	73	169	220	220	129	163	155	326	440	542	100	62
FCS4 50-200/11	50	50	110	73	169	220	220	121	163	176	326	440	560	100	66
FCS4 50-250/15	50	50	110	73	169	220	220	121	163	176	326	440	560	100	67
FCS4 50-250/22	50	50	110	73	179	220	220	133	163	193	326	440	596	100	69
FCS4 65-160/07	65	65	77	83	185	170	170	129	137	155	274	340	531	92	48
FCS4 65-160/11	65	65	77	83	185	170	170	121	137	176	274	340	549	92	49
FCS4 65-200/15	65	65	119	83	165	237,5	237,5	121	172	176	335	475	565	104	66
FCS4 65-250/22	65	65	119	83	175	237,5	237,5	133	172	193	335	475	601	104	75
FCS4 65-250/30	65	65	119	83	175	237,5	237,5	133	172	193	335	475	601	104	78
FCS4 80-125/07	80	80	90	90	212	175	185	129	148	155	287	360	565	102	54
FCS4 80-125/11	80	80	90	90	212	175	185	121	148	176	287	360	583	102	60
FCS4 80-200/15	80	80	130	90	181	250	250	121	184	176	347	500	592	112	86
FCS4 80-200/22	80	80	130	90	191	250	250	133	184	193	347	500	628	112	86
FCS4 80-200/30	80	80	130	90	191	250	250	133	184	193	347	500	628	112	88
FCS4 80-250/40	80	80	130	90	191	250	250	151	184	220	347	500	651	112	105
FCS4 80-250/55	80	80	130	90	218	250	250	194	184	257	354	500	714	112	110
FCS4 100-160/15	100	100	105	105	221	225	225	121	172	176	311	450	607	117	72
FCS4 100-200/22	100	100	140	105	202	275	275	133	196	193	362	550	649	129	76
FCS4 100-200/30	100	100	140	105	202	225	275	133	196	193	362	550	649	129	79
FCS4 100-250/40	100	100	140	105	202	275	275	151	196	220	362	550	672	129	120
FCS4 100-250/55	100	100	140	105	229	275	275	194	196	257	362	550	735	129	123
FCS4 100-250/75	100	100	140	105	229	275	275	194	196	257	362	550	773	129	134

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**FCS4 (125÷150) SERIES
DIMENSIONS AND WEIGHTS**



- (1) R 1/4 AIR VALVE
- (2) R 1/4 PRESSURE GAUGE CONNECTOR
- (3) R 1/4 DRAIN

PUMP FLANGES

DN	D	M	G	HOLES		THICKNESS
				N°	D I A .	MAX .
125	250	210	188	8	18	26
150	285	240	212	8	23	26

04852D_A_DD

FCS4 (125÷150) SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	DIMENSIONS (mm) PUMP														WEIGHT kg
	DNA	DNM	b1	d	f	h1	h2	h3	l1	l2	B	H max	L	k	
FCS4 125-160/30	125	125	234	274	196	315	68	137	85	161	418	630	664	143	123
FCS4 125-200/40	125	125	202	274	196	290	68	137	80	164	378	620	690	153	113
FCS4 125-200/55	125	125	202	274	196	290	68	137	80	164	378	620	726	153	135
FCS4 125-250/75	125	125	220	320	196	300	80	160	75	168	422	630	768	150	154
FCS4 125-250/110	125	125	220	320	226	300	80	160	75	168	422	630	932	150	180
FCS4 125-315/150	125	125	262	320	226	350	80	160	130	229	503	775	993	160	258
FCS4 125-315/185	125	125	262	320	226	350	80	160	130	229	503	775	993	160	270
FCS4 125-315/220	125	125	262	320	226	350	80	160	130	229	503	775	1068	160	292
FCS4 150-200/55	150	150	260	320	211	340	80	160	90	178	468	720	755	160	107
FCS4 150-200/75	150	150	260	320	211	340	80	160	90	178	468	720	793	160	164
FCS4 150-250/110	150	150	276	320	226	365	80	160	85	188	504	755	952	158	204
FCS4 150-250/150	150	150	276	320	226	365	80	160	85	188	504	755	952	158	218
FCS4 150-250/185	150	150	276	320	226	365	80	160	85	188	504	755	952	158	230

PUMP TYPE	DIMENSIONS (mm) SUPPORT FOOT										
	A1	A2	C	m	m1	m2	n	n1	s	x	
FCS4 125-160/30	230	250	480	388	96	192	389	166	M16	120	
FCS4 125-200/40	230	250	480	388	96	192	389	166	M16	120	
FCS4 125-200/55	230	250	480	388	96	192	389	166	M16	120	
FCS4 125-250/75	270	300	580	453	112	225	457	195	M16	140	
FCS4 125-250/110	270	300	580	453	112	225	457	195	M16	140	
FCS4 125-315/150	270	300	580	453	112	225	457	195	M16	140	
FCS4 125-315/185	270	300	580	453	112	225	457	195	M16	140	
FCS4 125-315/220	270	300	580	453	112	225	457	195	M16	140	
FCS4 150-200/55	270	300	580	453	112	225	457	195	M16	140	
FCS4 150-200/75	270	300	580	453	112	225	457	195	M16	140	
FCS4 150-250/110	270	300	580	453	112	225	457	195	M16	140	
FCS4 150-250/150	270	300	580	453	112	225	457	195	M16	140	
FCS4 150-250/185	270	300	580	453	112	225	457	195	M16	140	

lmr_fcs4-4p50_b_td

**FCTE SERIES
DIMENSIONS AND WEIGHTS**

(1) R 1/8
(2) R 3/8

DNM DNA

h1 H

(1)

(2)

(3)

x

p p

(3) R 3/8

N*3xø 30 N*3xM12

x

h2 h3

B

b1

**238 **238 **238

**
15-18.5-22 kW

D G

DN M

D G

DN M

DN	D	M	G			MAX.
				N°	DIA.	
40	150	110	88	4	18	18
50	165	125	102	4	18	20
65	185	145	122	4	18	20
80	200	160	138	8	18	22
100	220	180	158	8	18	22

05204_A_DD

FCTE SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	DIMENSIONS (mm)													WEIGHT
	DNA	DNM	b1	h1	h2	h3	l1	p	x	B	H	L	k	kg
FCTE 40-125/07	40	40	245	170	50	120	89	155	250	490	320	452	90	52
FCTE 40-125/11	40	40	245	170	50	120	89	155	250	490	320	452	90	54
FCTE 40-160/15	40	40	245	170	50	120	89	155	250	490	320	452	90	56
FCTE 40-160/22	40	40	245	170	50	120	89	155	250	490	320	452	90	58
FCTE 40-200/40A	40	40	348	220	50	190	97	193	360	695	440	504	101	129
FCTE 40-200/40	40	40	348	220	50	190	97	193	360	695	440	504	101	129
FCTE 40-200/55	40	40	348	220	50	190	97	220	360	695	440	550	101	135
FCTE 40-250/75	40	40	348	220	50	190	97	220	360	695	440	550	101	147
FCTE 40-250/110	40	40	348	220	50	190	97	257	360	695	440	601	101	169
FCTE 50-125/11	50	50	250	180	55	130	92	155	260	500	340	457	91	53
FCTE 50-125/15	50	50	250	180	55	130	92	155	260	500	340	457	91	59
FCTE 50-160/22	50	50	250	180	55	130	92	155	260	500	340	457	91	71
FCTE 50-160/30	50	50	250	180	55	130	92	176	260	500	340	475	91	77
FCTE 50-160/40	50	50	250	180	55	130	92	193	260	500	340	501	91	81
FCTE 50-200/55	50	50	348	230	60	185	125	220	360	695	440	578	110	102
FCTE 50-200/75	50	50	348	230	60	185	125	220	360	695	440	578	110	110
FCTE 50-250/92	50	50	348	230	60	185	125	257	360	695	440	629	110	188
FCTE 50-250/110	50	50	348	230	60	185	125	257	360	695	440	629	110	200
FCTE 50-250/150	50	50	348	230	60	185	125	310	360	695	440	713	110	216
FCTE 65-125/22	65	65	297	185	55	125	108	155	310	593	340	474	96	97
FCTE 65-125/30	65	65	297	185	55	125	108	176	310	593	340	492	96	105
FCTE 65-125/40	65	65	297	185	55	125	108	193	310	593	340	518	96	111
FCTE 65-160/55	65	65	297	185	55	125	108	220	310	593	340	564	96	131
FCTE 65-160/75	65	65	297	185	55	125	108	220	310	593	340	564	96	141
FCTE 65-200/92	65	65	348	260	59	185	130	257	360	695	475	634	109	192
FCTE 65-200/110	65	65	348	260	59	185	130	257	360	695	475	634	109	206
FCTE 65-250/150	65	65	348	260	59	185	130	310	360	695	475	718	109	238
FCTE 65-250/185	65	65	348	260	59	185	130	310	360	695	475	762	109	252
FCTE 65-250/220	65	65	348	260	59	185	130	310	360	695	475	762	109	268
FCTE 80-125/30	80	80	304	210	70	110	141	176	320	607	400	531	106	119
FCTE 80-125/40	80	80	304	210	70	110	141	193	320	607	400	557	106	123
FCTE 80-125/55	80	80	304	210	70	110	141	220	320	607	400	603	106	131
FCTE 80-160/75	80	80	304	210	70	110	141	220	320	607	400	603	106	139
FCTE 80-200/110	80	80	368	280	80	140	157	257	380	722	500	661	112	221
FCTE 80-200/150	80	80	368	280	80	140	157	310	380	722	500	745	112	241
FCTE 80-200/185	80	80	368	280	80	140	157	310	380	722	500	789	112	271
FCTE 80-200/220	80	80	368	280	80	140	157	310	380	722	500	789	112	291
FCTE 100-160/110	100	100	340	270	72	150	175	257	360	670	500	680	118	242
FCTE 100-200/185	100	100	408	310	80	150	180	310	410	798	550	812	128	365
FCTE 100-200/220	100	100	408	310	80	150	180	310	410	798	550	812	128	383

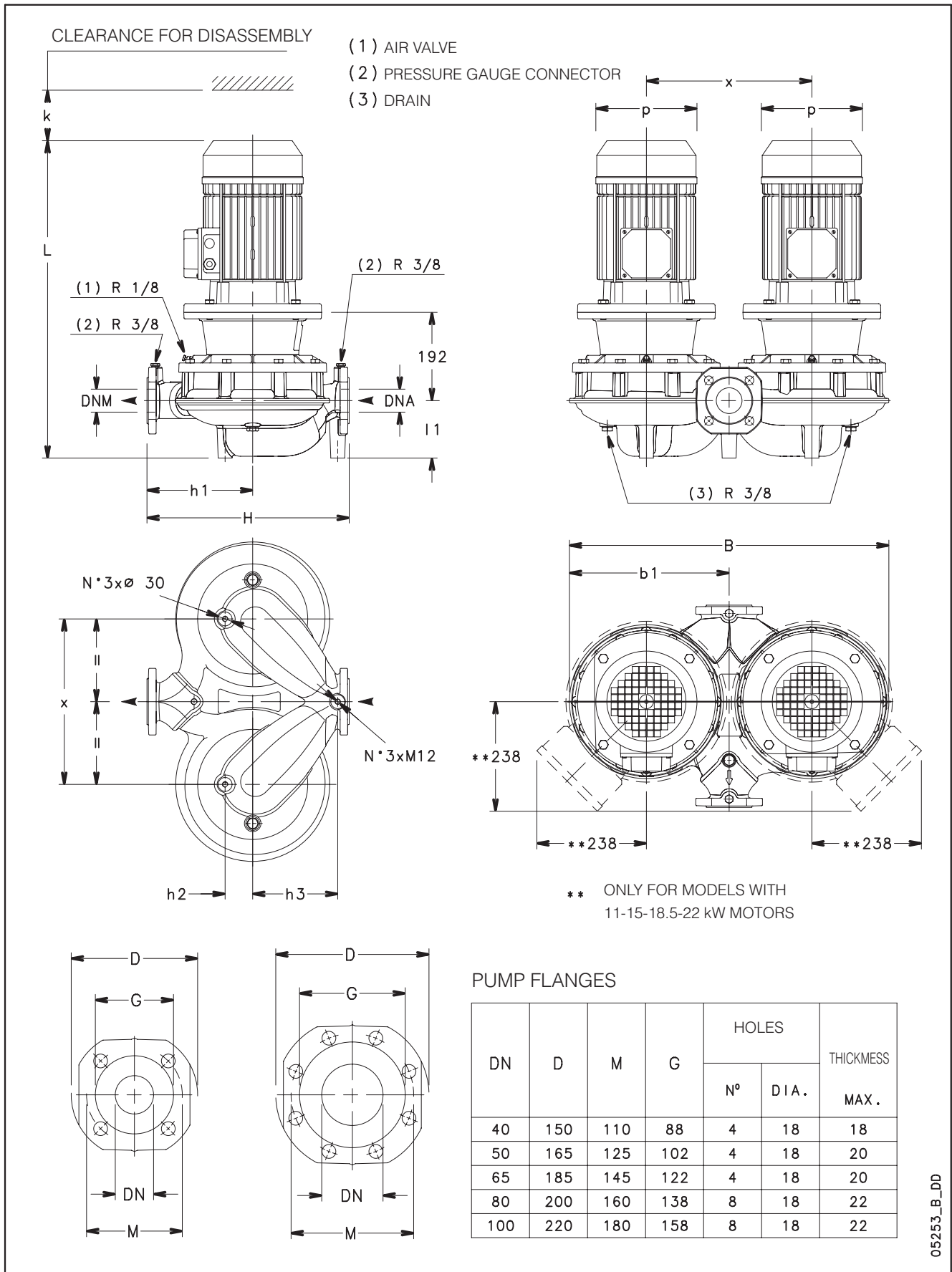
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FCTE4 SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	DIMENSIONS (mm)													WEIGHT kg
	DNA	DNM	b1	h1	h2	h3	l1	p	x	B	H	L	k	
FCTE4 40-125/02A	40	40	245	170	50	120	89	140	250	490	320	420	90	46
FCTE4 40-125/02	40	40	245	170	50	120	89	140	250	490	320	420	90	46
FCTE4 40-160/02	40	40	245	170	50	120	89	140	250	490	320	420	90	48
FCTE4 40-160/03	40	40	245	170	50	120	89	140	250	490	320	420	90	50
FCTE4 40-200/05	40	40	348	220	50	190	97	155	360	695	440	460	101	83
FCTE4 40-200/07	40	40	348	220	50	190	97	155	360	695	440	460	101	83
FCTE4 40-250/11	40	40	348	220	50	190	97	176	360	695	440	478	101	111
FCTE4 40-250/15	40	40	348	220	50	190	97	176	360	695	440	478	101	113
FCTE4 50-125/02	50	50	250	180	55	130	92	140	260	500	340	425	91	49
FCTE4 50-125/03	50	50	250	180	55	130	92	140	260	500	340	425	91	51
FCTE4 50-160/05	50	50	250	180	55	130	92	155	260	500	340	457	91	53
FCTE4 50-200/07	50	50	348	230	60	185	125	155	360	695	440	488	110	102
FCTE4 50-200/11	50	50	348	230	60	185	125	176	360	695	440	506	110	110
FCTE4 50-250/15	50	50	348	230	60	185	125	176	360	695	440	506	110	116
FCTE4 50-250/22	50	50	348	230	60	185	125	193	360	695	440	532	110	122
FCTE4 65-125/03	65	65	297	185	55	125	108	140	310	593	340	442	96	75
FCTE4 65-125/05	65	65	297	185	55	125	108	155	310	593	340	474	96	83
FCTE4 65-160/07	65	65	297	185	55	125	108	155	310	593	340	474	96	91
FCTE4 65-160/11	65	65	297	185	55	125	108	176	310	593	340	492	96	95
FCTE4 65-200/15	65	65	348	260	59	185	130	176	360	695	475	511	109	118
FCTE4 65-250/22	65	65	348	260	59	185	130	193	360	695	475	537	109	134
FCTE4 65-250/30	65	65	348	260	59	185	130	193	360	695	475	537	109	138
FCTE4 80-125/07	80	80	304	210	70	110	141	155	320	607	400	513	106	98
FCTE4 80-125/11	80	80	304	210	70	110	141	176	320	607	400	531	106	104
FCTE4 80-200/15	80	80	368	280	80	140	157	176	380	722	500	538	112	141
FCTE4 80-200/22	80	80	368	280	80	140	157	193	380	722	500	564	112	147
FCTE4 80-200/30	80	80	368	280	80	140	157	193	380	722	500	564	112	155
FCTE4 80-250/40	80	80	368	280	80	140	157	220	380	722	500	587	112	185
FCTE4 80-250/55	80	80	368	280	80	140	157	257	380	722	500	623	112	203
FCTE4 100-160/15	100	100	340	270	72	150	175	176	360	670	500	557	118	134
FCTE4 100-200/22	100	100	408	310	80	150	180	193	410	798	550	587	128	183
FCTE4 100-200/30	100	100	408	310	80	150	180	193	410	798	550	587	128	187
FCTE4 100-250/40	100	100	408	310	80	150	180	220	410	798	550	610	128	213
FCTE4 100-250/55	100	100	408	310	80	150	180	257	410	798	550	646	128	227
FCTE4 100-250/75	100	100	408	310	80	150	180	257	410	798	550	646	128	259

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**FCTS SERIES
DIMENSIONS AND WEIGHTS**

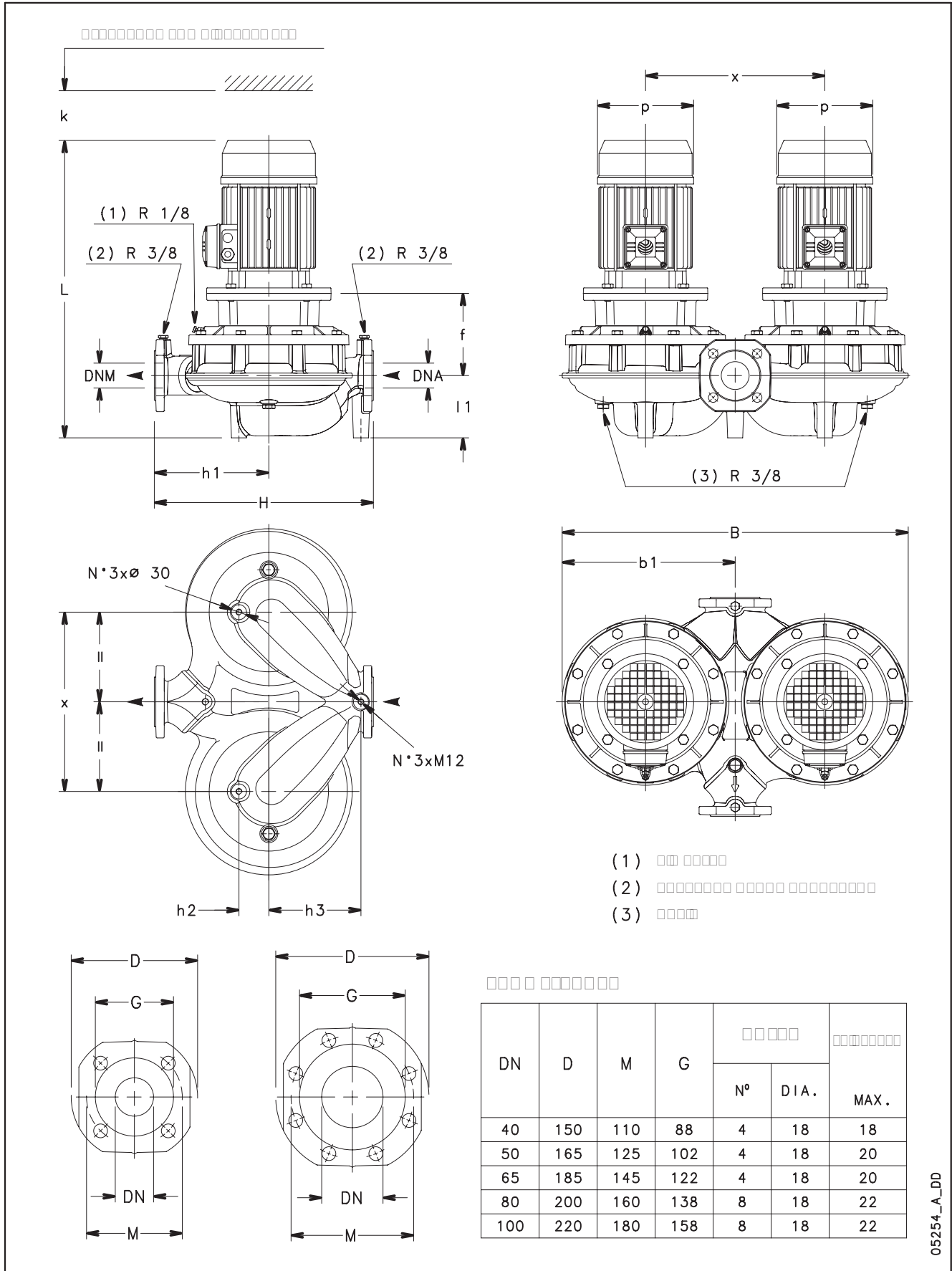


FCTS SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	DIMENSIONS (mm)											WEIGHT			
	DNA	DNM	b1	f	h1	h2	h3	l1	p	x	B	H	L	k	kg
FCTS 40-125/07	40	40	245	155	170	50	120	89	140	250	490	320	470	90	58
FCTS 40-125/11	40	40	245	155	170	50	120	89	155	250	490	320	507	90	60
FCTS 40-160/15	40	40	245	155	170	50	120	89	155	250	490	320	507	90	62
FCTS 40-160/22	40	40	245	155	170	50	120	89	155	250	490	320	507	90	66
FCTS 40-200/30	40	40	348	165	220	50	190	97	176	360	695	440	565	101	125
FCTS 40-200/40	40	40	348	165	220	50	190	97	193	360	695	440	569	101	135
FCTS 40-200/55	40	40	348	192	220	50	190	97	220	360	695	440	663	101	165
FCTS 40-250/75	40	40	348	192	220	50	190	97	220	360	695	440	663	101	177
FCTS 40-250/110	40	40	348	222	220	50	190	97	257	360	695	440	746	101	225
FCTS 50-125/11	50	50	250	157	180	55	130	92	155	260	500	340	512	91	63
FCTS 50-125/15	50	50	250	157	180	55	130	92	155	260	500	340	512	91	67
FCTS 50-160/22	50	50	250	157	180	55	130	92	155	260	500	340	512	91	83
FCTS 50-160/30	50	50	250	167	180	55	130	92	176	260	500	340	562	91	87
FCTS 50-160/40	50	50	250	167	180	55	130	92	193	260	500	340	566	91	99
FCTS50-200/55	50	50	348	192	230	60	185	125	220	360	695	440	691	110	172
FCTS 50-200/75	50	50	348	192	230	60	185	125	220	360	695	440	691	110	182
FCTS 50-250/110A	50	50	348	222	230	60	185	125	257	360	695	440	774	110	216
FCTS 50-250/110	50	50	348	222	230	60	185	125	257	360	695	440	774	110	216
FCTS 50-250/150	50	50	348	222	230	60	185	125	310	360	695	440	835	110	236
FCTS 65-125/22	65	65	297	158	185	55	125	108	155	310	593	340	529	96	127
FCTS 65-125/30	65	65	297	168	185	55	125	108	176	310	593	340	579	96	115
FCTS 65-125/40	65	65	297	168	185	55	125	108	193	310	593	340	583	96	123
FCTS 65-160/55	65	65	297	195	185	55	125	108	220	310	593	340	677	96	153
FCTS 65-160/75	65	65	297	195	185	55	125	108	220	310	593	340	677	96	159
FCTS 65-200/110A	65	65	348	222	260	59	185	130	257	360	695	475	779	109	248
FCTS 65-200/110	65	65	348	222	260	59	185	130	257	360	695	475	779	109	248
FCTS 65-250/150	65	65	348	222	260	59	185	130	310	360	695	475	840	109	250
FCTS 65-250/185	65	65	348	222	260	59	185	130	310	360	695	475	884	109	272
FCTS 65-250/220	65	65	348	222	260	59	185	130	310	360	695	475	884	109	288
FCTS 80-125/30	80	80	304	174	210	70	110	141	176	320	607	400	618	106	154
FCTS 80-125/40	80	80	304	174	210	70	110	141	193	320	607	400	622	106	154
FCTS 80-125/55	80	80	304	201	210	70	110	141	220	320	607	400	716	106	164
FCTS 80-160/75	80	80	304	201	210	70	110	141	220	320	607	400	716	106	172
FCTS 80-200/110	80	80	368	222	280	80	140	157	257	380	722	500	806	112	241
FCTS 80-200/150	80	80	368	222	280	80	140	157	310	380	722	500	867	112	261
FCTS 80-200/185	80	80	368	222	280	80	140	157	310	380	722	500	911	112	289
FCTS 80-200/220	80	80	368	222	280	80	140	157	310	380	722	500	911	112	311
FCTS 100-160/110	100	100	340	223	270	72	150	175	257	360	670	500	825	118	258
FCTS 100-200/185	100	100	408	222	310	80	150	180	310	410	798	550	934	128	384
FCTS 100-200/220	100	100	408	222	310	80	150	180	310	410	798	550	934	128	403

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**FCTS4 SERIES
DIMENSIONS AND WEIGHTS**



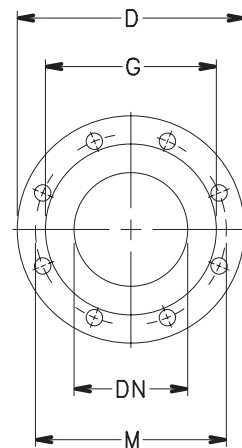
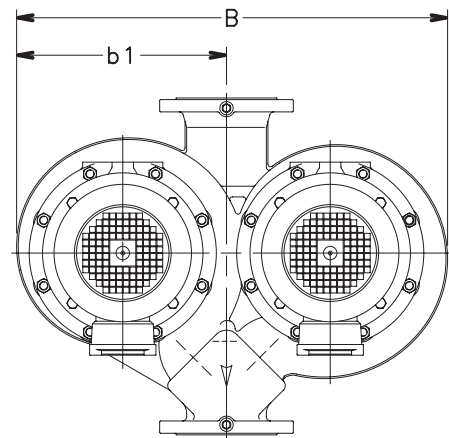
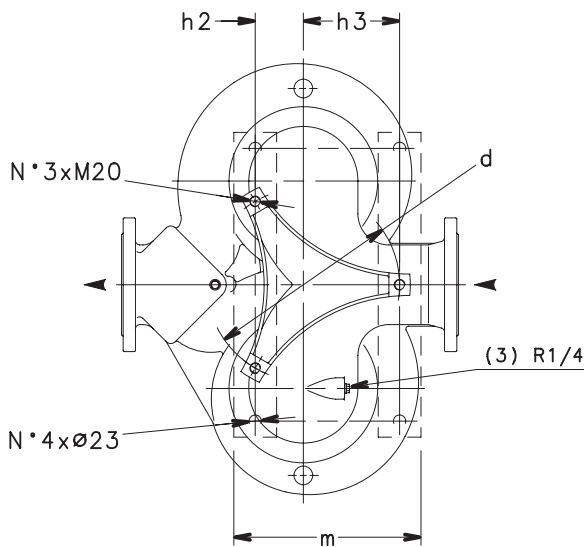
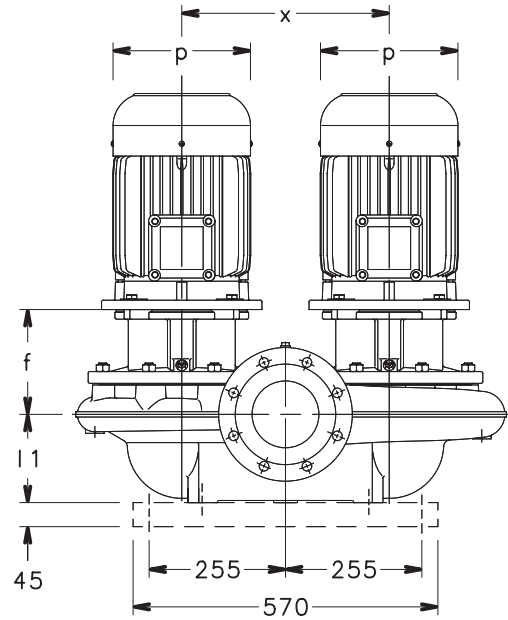
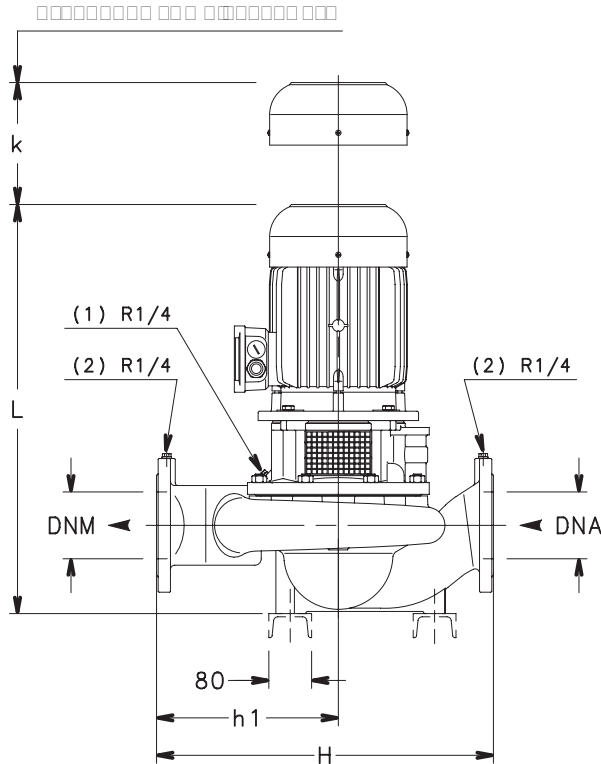
05254_A_DD

FCTS4 SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	DIMENSIONS (mm)														WEIGHT
	DNA	DNM	b1	f	h1	h2	h3	l1	p	x	B	H max	L	k	kg
FCTS4 40-200/05	40	40	348	155	220	50	190	97	155	360	695	440	515	101	107
FCTS4 40-200/07	40	40	348	155	220	50	190	97	155	360	695	440	515	101	113
FCTS4 40-250/11	40	40	348	155	220	50	190	97	176	360	695	440	533	101	117
FCTS4 40-250/15	40	40	348	155	220	50	190	97	176	360	695	440	533	101	121
FCTS4 50-200/07	50	50	348	155	230	60	185	125	155	360	695	440	543	110	120
FCTS4 50-200/11	50	50	348	155	230	60	185	125	176	360	695	440	561	110	128
FCTS4 50-250/15	50	50	348	155	230	60	185	125	176	360	695	440	561	110	130
FCTS4 50-250/22	50	50	348	165	230	60	185	125	193	360	695	440	597	110	134
FCTS4 65-160/07	65	65	297	158	185	55	125	108	155	310	593	340	529	96	95
FCTS4 65-160/11	65	65	297	158	185	55	125	108	176	310	593	340	547	96	97
FCTS4 65-200/15	65	65	348	155	260	59	185	130	176	360	695	475	566	109	124
FCTS4 65-250/22	65	65	348	165	260	59	185	130	193	360	695	475	602	109	142
FCTS4 65-250/30	65	65	348	165	260	59	185	130	193	360	695	475	602	109	148
FCTS4 80-125/07	80	80	304	164	210	70	110	141	155	320	607	400	568	106	106
FCTS4 80-125/11	80	80	304	164	210	70	110	141	176	320	607	400	586	106	118
FCTS4 80-200/15	80	80	368	155	280	80	140	157	176	380	722	500	593	112	163
FCTS4 80-200/22	80	80	368	165	280	80	140	157	193	380	722	500	629	112	163
FCTS4 80-200/30	80	80	368	165	280	80	140	157	193	380	722	500	629	112	167
FCTS4 80-250/40	80	80	368	165	280	80	140	157	220	380	722	500	652	112	201
FCTS4 80-250/55	80	80	368	192	280	80	140	157	257	380	722	500	715	112	211
FCTS4 100-160/15	100	100	340	156	270	72	150	175	176	360	670	500	612	118	142
FCTS4 100-200/22	100	100	408	165	310	80	150	180	193	410	798	550	652	128	155
FCTS4 100-200/30	100	100	408	165	310	80	150	180	193	410	798	550	652	128	161
FCTS4 100-250/40	100	100	408	165	310	80	150	180	220	410	798	550	675	128	243
FCTS4 100-250/55	100	100	408	192	310	80	150	180	257	410	798	550	738	128	249
FCTS4 100-250/75	100	100	408	192	310	80	150	180	257	410	798	550	776	128	271

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**FCTS4 (125÷150) SERIES
DIMENSIONS AND WEIGHTS**



- (1) □□ □□□□
- (2) □□□□□□ □□□□ □□□□□□□□
- (3) □□□□

□□□□ □□□□□□□□

DN	D	M	G	□□□□		□□□□□□□□
				N°	DIA.	MAX.
125	250	210	188	8	18	26
150	285	240	212	8	23	26

05255_A_DD

FCTS4 (125÷150) SERIES DIMENSIONS AND WEIGHTS

PUMP TYPE	PUMP DIMENSIONS (mm)														WEIGHT		
	DNA	DNM	b1	d	f	h ₁	h ₂	h ₃	l ₁	m	p	x	B	H	L	k	kg
FCTS4 125-160/30	125	125	422	360	196	350	90	180	175	350	193	386	800	630	678	143	236
FCTS4 125-200/40	125	125	368	360	196	330	90	180	160	350	220	349	716	620	686	153	212
FCTS4 125-200/55	125	125	368	360	196	330	90	180	160	350	257	349	716	620	722	153	256
FCTS4 125-250/75	125	125	412	360	196	340	90	180	165	350	257	388	805	630	765	150	299
FCTS4 125-250/110	125	125	412	360	226	340	90	180	165	350	314	388	805	630	929	150	351
FCTS4 150-200/55	150	150	471	460	211	400	115	230	175	425	257	440	900	720	752	160	318
FCTS4 150-200/75	150	150	471	460	211	400	115	230	175	425	257	440	900	720	790	160	324
FCTS4 150-250/110	150	150	498	460	226	405	115	230	200	425	314	466	963	755	964	158	430
FCTS4 150-250/150	150	150	498	460	226	405	115	230	200	425	314	466	963	755	964	158	458
FCTS4 150-250/185	150	150	498	460	226	405	115	230	200	425	314	466	963	755	964	158	482

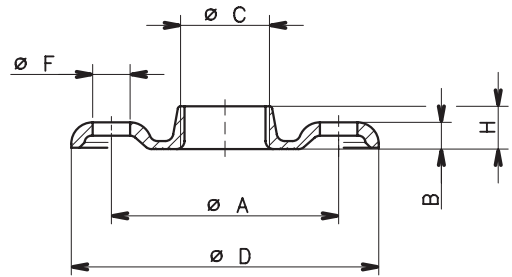
lmz_fcts4-4p50_b_td

ACCESSORIES

**FC-FCT SERIES
ROUND THREADED COUNTERFLANGES ACCORDING TO EN 1092-1**

DN	ø C	DIMENSIONS (mm)				HOLES		PN
		ø A	B	ø D	H	ø F	N°	
40	Rp 1 1/2	110	14	150	19	18	4	16
50	Rp 2	125	16	165	24	18	4	16
65	Rp 2 1/2	145	16	185	23	18	4	16
80	Rp 3	160	17	200	27	18	8	16
100	Rp 4	180	18	220	31	18	8	16

fc-fct-ctf-tonde-f_a_td

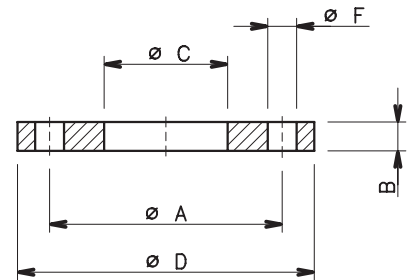


04430_B_DD

**FC-FCT SERIES
ROUND WELD COUNTERFLANGES ACCORDING TO EN 1092-1**

DN	ø C	DIMENSIONS (mm)			HOLES		
		ø A	B	ø D	ø F	N°	PN
65	77	145	18	185	18	4	16
80	90	160	20	200	18	8	16
100	115,5	180	22	220	18	8	16
125	141,5	210	22	250	18	8	16
150	170,5	240	24	285	22	8	16

fc-fct-ctf-tonde-s_a_td

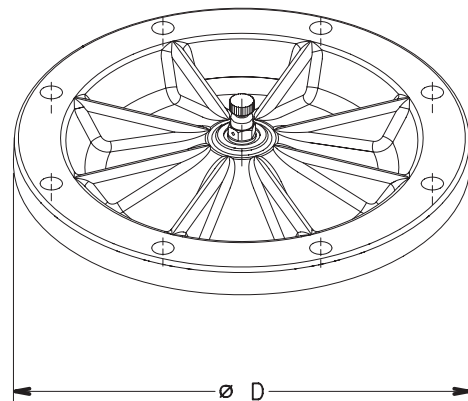


04431_A_DD

**SERIE FCT
BLIND FLANGE KIT**

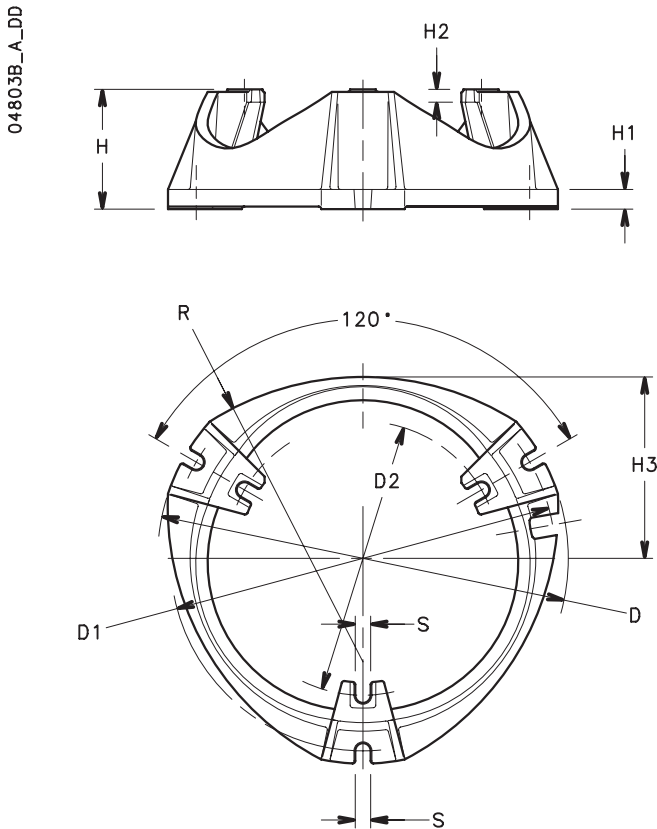
FLANGE KIT		
PUMP TYPE	CODE	ø D
FCT40-125 / FCT40-160	109393750	225
FCT50-125 / FCT50-160		
FCT65-125 / FCT65-160	109393760	274
FCT80-125 / FCT80-160		
FCT100-160	109393770	322
FCT40-200 / FCT40-250		
FCT50-200 / FCT50-250		
FCT65-200 / FCT65-250		
FCT80-200 / FCT80-250		
FCT100-200 / FCT100-250	109393800	280
FCT125-160 / FCT125-200		
FCT150-200	109393810	305
FCT125-250 / FCT150-250	109393820	350

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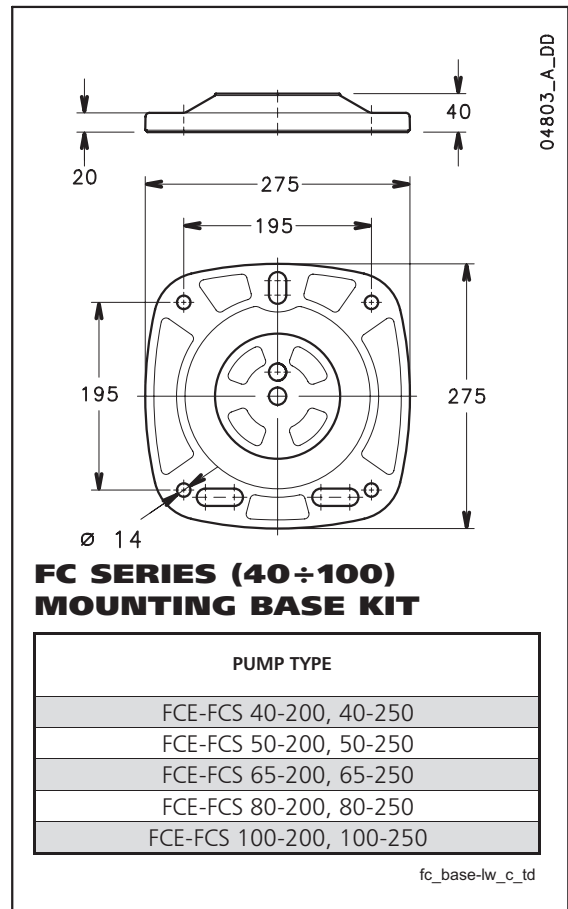


05262_A_DD

**FC SERIES
MOUNTING BASE**



**FC SERIES (125÷150)
MOUNTING BASE KIT**



**FC SERIES (40÷100)
MOUNTING BASE KIT**

PUMP TYPE
FCE-FCS 40-200, 40-250
FCE-FCS 50-200, 50-250
FCE-FCS 65-200, 65-250
FCE-FCS 80-200, 80-250
FCE-FCS 100-200, 100-250

fc_base-lw_c_td

PUMP TYPE	DIMENSIONS (mm)								
	R	D	D1	D2	H	H1	H2	H3	S
FCS4 125-160, 125-200	273	410	384	274	120	20	14	183	14
FCS4 125-250, 125-315, 150-200, 150-250	333	480	450	320	140	23	15	212	18

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**FC SERIES
BRACKETS**

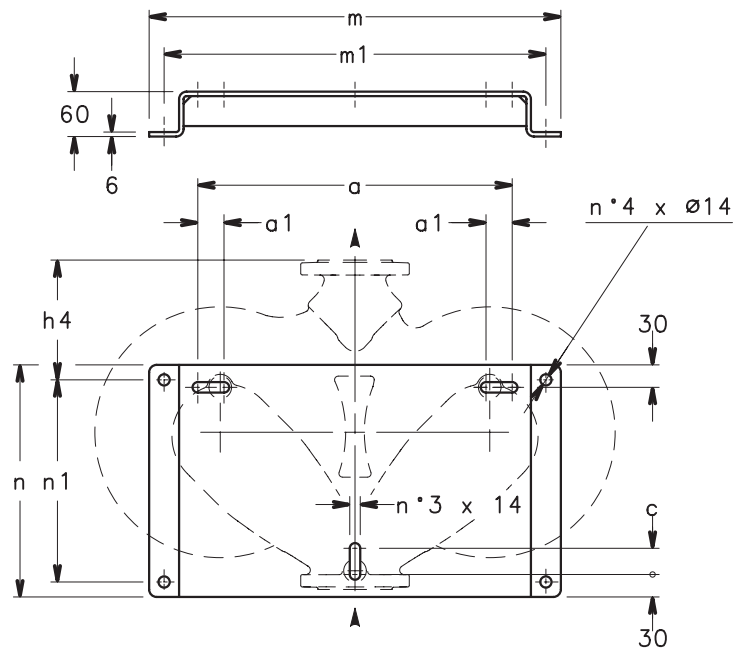
**FC SERIES (40÷100)
KIT SUPPORT**

PUMP TYPE		SHAPE	DIMENSIONS (mm)				
			A	m	m1	n	n1
FCE 40-125 / FCE 40-160	FCE4 40-125 / FCE4 40-160	A	100	284	210	150	110
FCS 40-125 / FCS 40-160							
FCE 40-200 / FCE 40-250	FCE4 40-200 / FCE4 40-250	A	100	404	330	150	110
FCS 40-200 / FCS 40-250	FCS4 40-200 / FCS4 40-250						
FCE 50-125 / FCE 50-160	FCE4 50-125 / FCE4 50-160	A	110	300	230	165	125
FCS 50-125 / FCS 50-160							
FCE 50-200 / FCE 50-250	FCE4 50-200 / FCE4 50-250	A	110	400	330	165	125
FCS 50-200 / FCS 50-250	FCS4 50-200 / FCS4 50-250						
FCE 65-125 / FCE 65-160	FCE4 65-125 / FCE4 65-160	A	120	300	230	185	145
FCS 65-125 / FCS 65-160	FCS4 65-160						
FCE 65-200 / FCE 65-250	FCE4 65-200 / FCE4 65-250	A	120	435	365	185	145
FCS 65-200 / FCS 65-250	FCS4 65-200 / FCS4 65-250						
FCE 80-125 / FCE 80-160	FCE4 80-125	B	130	316	250	200	160
FCS 80-125 / FCS 80-160	FCS4 80-125						
FCE 80-200	FCE4 80-200 / FCE4 80-250	B	130	456	390	200	160
FCS 80-200	FCS4 80-200 / FCS4 80-250						
FCE 100-160	FCE4 100-160	B	140	402	330	220	180
FCS 100-160	FCS4 100-160						
FCE 100-200	FCE4 100-200 / FCE4 100-250	B	140	502	430	220	180
FCS 100-200	FCS4 100-200 / FCS4 100-250						

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**FCT SERIES (40÷100)
MOUNTING BASE KIT**

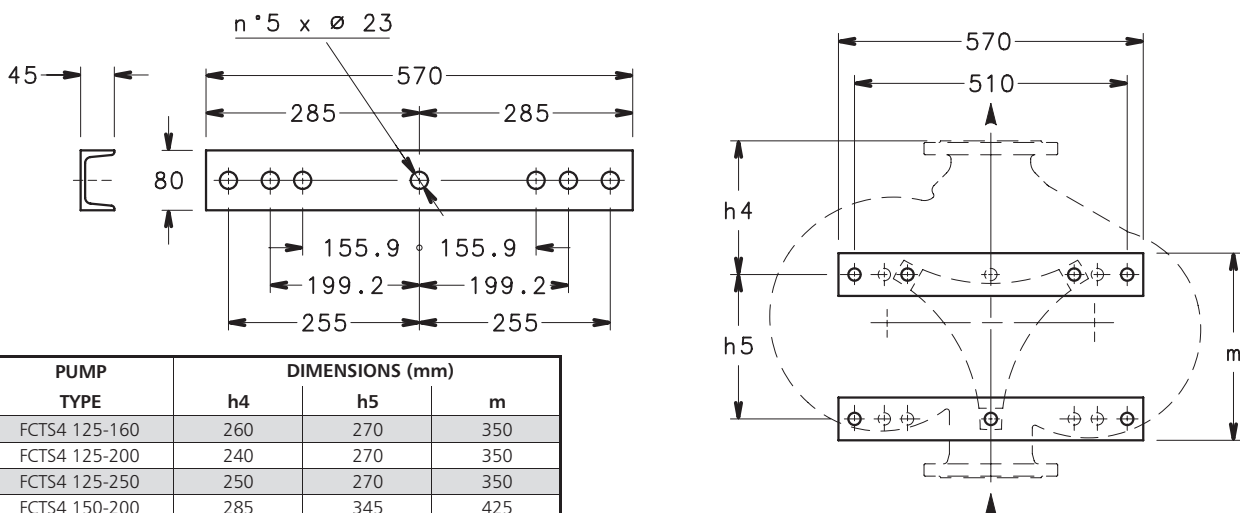


PUMP SIZE	DIMENSIONS (mm)							
	a	a1	c	h4	m	m1	n	n1
40-125 / 40-160	330	45	25	110	460	420	250	210
50-125 / 50-160	330	45	25	115	460	420	250	210
65-125 / 65-160	330	45	25	120	460	420	250	210
80-125 / 80-160	330	45	25	130	460	420	250	210
100-160	420	35	35	188	550	510	310	270
40-200 / 40-250	420	35	35	160	550	510	310	270
50-200 / 50-250	420	35	35	160	550	510	310	270
65-200 / 65-250	420	35	35	191	550	510	310	270
80-200 / 80-250	420	35	35	190	550	510	310	270
100-200 / 100-250	420	35	35	220	550	510	310	270

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**FCT SERIES (125÷150)
MOUNTING BASE KIT**



PUMP TYPE	DIMENSIONS (mm)		
	h4	h5	m
FCTS4 125-160	260	270	350
FCTS4 125-200	240	270	350
FCTS4 125-250	250	270	350
FCTS4 150-200	285	345	425
FCTS4 150-250	290	345	425

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TECHNICAL APPENDIX

TYPICAL APPLICATIONS OF FC, FCT SERIES ELECTRIC PUMPS:*Heating, Ventilating &
Air Conditioning (HVAC)*

Condensate return
Air scrubbers
Water re-circulation
Cooling towers
Cooling systems
Temperature control
Chillers
Induction heating
Heat exchangers
Water heating
Booster packagers

Graphics

Film washing
Cooling of presses

Waste Management

Waste treatment
Pollution control

Agriculture

Irrigation
Greenhouses
Cotton humidifiers

Laundry

Commercial washing

NPSH

The minimum operating values that can be reached at the pump suction end are limited by the onset of cavitation.

Cavitation is the formation of vapour-filled cavities within liquids where the pressure is locally reduced to a critical value, or where the local pressure is equal to, or just below the vapour pressure of the liquid.

The vapour-filled cavities flow with the current and when they reach a higher pressure area the vapour contained in the cavities condenses. The cavities collide, generating pressure waves that are transmitted to the walls. These, being subjected to stress cycles, gradually become deformed and yield due to fatigue. This phenomenon, characterized by a metallic noise produced by the hammering on the pipe walls, is called incipient cavitation.

The damage caused by cavitation may be magnified by electrochemical corrosion and a local rise in temperature due to the plastic deformation of the walls. The materials that offer the highest resistance to heat and corrosion are alloy steels, especially austenitic steel. The conditions that trigger cavitation may be assessed by calculating the total net suction head, referred to in technical literature with the acronym NPSH (Net Positive Suction Head).

The NPSH represents the total energy (expressed in m.) of the liquid measured at suction under conditions of incipient cavitation, excluding the vapour pressure (expressed in m.) that the liquid has at the pump inlet.

To find the static height h_z at which to install the machine under safe conditions, the following formula must be verified:

$$h_p + h_z \geq (NPSH_r + 0.5) + h_f + h_{pv} \quad \textcircled{1}$$

where:

- h_p** is the absolute pressure applied to the free liquid surface in the suction tank, expressed in m. of liquid; h_p is the quotient between the barometric pressure and the specific weight of the liquid.
- h_z** is the suction lift between the pump axis and the free liquid surface in the suction tank, expressed in m.; h_z is negative when the liquid level is lower than the pump axis.
- h_f** is the flow resistance in the suction line and its accessories, such as: fittings, foot valve, gate valve, elbows, etc.
- h_{pv}** is the vapour pressure of the liquid at the operating temperature, expressed in m. of liquid. h_{pv} is the quotient between the P_v vapour pressure and the liquid's specific weight.
- 0.5** is the safety factor.

The maximum possible suction head for installation depends on the value of the atmospheric pressure (i.e. the elevation above sea level at which the pump is installed) and the temperature of the liquid.

To help the user, with reference to water temperature (4°C) and to the elevation above sea level, the following tables show the drop in hydraulic pressure head in relation to the elevation above sea level, and the suction loss in relation to temperature.

Water temperature (°C)	20	40	60	80	90	110	120
Suction loss (m)	0,2	0,7	2,0	5,0	7,4	15,4	21,5

Elevation above sea level (m)	500	1000	1500	2000	2500	3000
Suction loss (m)	0,55	1,1	1,65	2,2	2,75	3,3

Flow resistance is shown in the tables at pages 121-122 of this catalogue. To reduce it to a minimum, especially in cases of high suction head (over 4-5 m.) or within the operating limits with high flow rates, we recommend using a suction line having a larger diameter than that of the pump's suction port. It is always a good idea to position the pump as close as possible to the liquid to be pumped.

Make the following calculation:

Liquid: water at ~ 15°C $\gamma = 1 \text{ kg/dm}^3$
 Flow rate required: 30 m³/h
 Head for required delivery: 43 m.
 Suction lift: 2.5 m.

The selection is an FCE 50-200/75 pump whose NPSH required value is, at 30 m³/h, 4.2 m.

For water at 15°C the h_{pv} is

$$h_p = \frac{P_a}{\gamma} = 10,33\text{m}, \quad h_{pv} = \frac{P_v}{\gamma} = 0,174 \text{ m (0.01701 bar)}$$

The H_f flow resistance in the suction line with foot valves is ~1.2 m.

By substituting the parameters in formula $\textcircled{1}$ with the numeric values above, we have:

$$10,33 + (-2,5) \geq (4,2 + 0,5) + 1,2 + 0,17$$

from which we have: 7.8 > 6.1

The relation is therefore verified.

ps VAPOUR PRESSURE AND ρ DENSITY OF WATER TABLE

t °C	T K	ps bar	ρ kg/dm ³
0	273,15	0,00611	0,9998
1	274,15	0,00657	0,9999
2	275,15	0,00706	0,9999
3	276,15	0,00758	0,9999
4	277,15	0,00813	1,0000
5	278,15	0,00872	1,0000
6	279,15	0,00935	1,0000
7	280,15	0,01001	0,9999
8	281,15	0,01072	0,9999
9	282,15	0,01147	0,9998
10	283,15	0,01227	0,9997
11	284,15	0,01312	0,9997
12	285,15	0,01401	0,9996
13	286,15	0,01497	0,9994
14	287,15	0,01597	0,9993
15	288,15	0,01704	0,9992
16	289,15	0,01817	0,9990
17	290,15	0,01936	0,9988
18	291,15	0,02062	0,9987
19	292,15	0,02196	0,9985
20	293,15	0,02337	0,9983
21	294,15	0,2485	0,9981
22	295,15	0,02642	0,9978
23	296,15	0,02808	0,9976
24	297,15	0,02982	0,9974
25	298,15	0,03166	0,9971
26	299,15	0,03360	0,9968
27	300,15	0,03564	0,9966
28	301,15	0,03778	0,9963
29	302,15	0,04004	0,9960
30	303,15	0,04241	0,9957
31	304,15	0,04491	0,9954
32	305,15	0,04753	0,9951
33	306,15	0,05029	0,9947
34	307,15	0,05318	0,9944
35	308,15	0,05622	0,9940
36	309,15	0,05940	0,9937
37	310,15	0,06274	0,9933
38	311,15	0,06624	0,9930
39	312,15	0,06991	0,9927
40	313,15	0,07375	0,9923
41	314,15	0,07777	0,9919
42	315,15	0,08198	0,9915
43	316,15	0,09639	0,9911
44	317,15	0,09100	0,9907
45	318,15	0,09582	0,9902
46	319,15	0,10086	0,9898
47	320,15	0,10612	0,9894
48	321,15	0,11162	0,9889
49	322,15	0,11736	0,9884
50	323,15	0,12335	0,9880
51	324,15	0,12961	0,9876
52	325,15	0,13613	0,9871
53	326,15	0,14293	0,9862
54	327,15	0,15002	0,9862
55	328,15	0,15741	0,9857

t °C	T K	ps bar	ρ kg/dm ³
56	329,15	0,16511	0,9852
57	330,15	0,17313	0,9846
58	331,15	0,18147	0,9842
59	332,15	0,19016	0,9837
60	333,15	0,19920	0,9232
61	334,15	0,2086	0,9826
62	335,15	0,2184	0,9821
63	336,15	0,2286	0,9816
64	337,15	0,2391	0,9811
65	338,15	0,2501	0,9805
66	339,15	0,2615	0,9799
67	340,15	0,2733	0,9793
68	341,15	0,2856	0,9788
69	342,15	0,2984	0,9782
70	343,15	0,3116	0,9777
71	344,15	0,3253	0,9770
72	345,15	0,3396	0,9765
73	346,15	0,3543	0,9760
74	347,15	0,3696	0,9753
75	348,15	0,3855	0,9748
76	349,15	0,4019	0,9741
77	350,15	0,4189	0,9735
78	351,15	0,4365	0,9729
79	352,15	0,4547	0,9723
80	353,15	0,4736	0,9716
81	354,15	0,4931	0,9710
82	355,15	0,5133	0,9704
83	356,15	0,5342	0,9697
84	357,15	0,5557	0,9691
85	358,15	0,5780	0,9684
86	359,15	0,6011	0,9678
87	360,15	0,6249	0,9671
88	361,15	0,6495	0,9665
89	362,15	0,6749	0,9658
90	363,15	0,7011	0,9652
91	364,15	0,7281	0,9644
92	365,15	0,7561	0,9638
93	366,15	0,7849	0,9630
94	367,15	0,8146	0,9624
95	368,15	0,8453	0,9616
96	369,15	0,8769	0,9610
97	370,15	0,9094	0,9602
98	371,15	0,9430	0,9596
99	372,15	0,9776	0,9586
100	373,15	1,0133	0,9581
102	375,15	1,0878	0,9567
104	377,15	1,1668	0,9552
106	379,15	1,2504	0,9537
108	381,15	1,3390	0,9522
110	383,15	1,4327	0,9507
112	385,15	1,5316	0,9491
114	387,15	1,6362	0,9476
116	389,15	1,7465	0,9460
118	391,15	1,8628	0,9445
120	393,15	1,9854	0,9429

t °C	T K	ps bar	ρ kg/dm ³
122	395,15	2,1145	0,9412
124	397,15	2,2504	0,9396
126	399,15	2,3933	0,9379
128	401,15	2,5435	0,9362
130	403,15	2,7013	0,9346
132	405,15	2,8670	0,9328
134	407,15	3,041	0,9311
136	409,15	3,223	0,9294
138	411,15	3,414	0,9276
140	413,15	3,614	0,9258
145	418,15	4,155	0,9214
150	423,15	4,760	0,9168
155	428,15	5,433	0,9121
160	433,15	6,181	0,9073
165	438,15	7,008	0,9024
170	443,15	7,920	0,8973
175	448,15	8,924	0,8921
180	453,15	10,027	0,8869
185	458,15	11,233	0,8815
190	463,15	12,551	0,8760
195	468,15	13,987	0,8704
200	473,15	15,55	0,8647
205	478,15	17,243	0,8588
210	483,15	19,077	0,8528
215	488,15	21,060	0,8467
220	493,15	23,198	0,8403
225	498,15	25,501	0,8339
230	503,15	27,976	0,8273
235	508,15	30,632	0,8205
240	513,15	33,478	0,8136
245	518,15	36,523	0,8065
250	523,15	39,776	0,7992
255	528,15	43,246	0,7916
260	533,15	46,943	0,7839
265	538,15	50,877	0,7759
270	543,15	55,058	0,7678
275	548,15	59,496	0,7593
280	553,15	64,202	0,7505
285	558,15	69,186	0,7415
290	563,15	74,461	0,7321
295	568,15	80,037	0,7223
300	573,15	85,927	0,7122
305	578,15	92,144	0,7017
310	583,15	98,700	0,6906
315	588,15	105,61	0,6791
320	593,15	112,89	0,6669
325	598,15	120,56	0,6541
330	603,15	128,63	0,6404
340	613,15	146,05	0,6102
350	623,15	165,35	0,5743
360	633,15	186,75	0,5275
370	643,15	210,54	0,4518
374,15	647,30	221,2	0,3154

TABLE OF FLOW RESISTANCE IN 100 m OF A NEW AND STRAIGHT CAST IRON PIPELINE



FLOW RATE		NOMINAL DIAMETER IN mm AND INCHES																			
m ³ /h	l/min.	15 ½"	20 ¾"	25 1"	32 1 ¼"	40 1 ½"	50 2"	65 2 ½"	80 3"	100 4"	125 5"	150 6"	175 7"	200 8"	250 10"	300 12"	350 14"	400 16"			
0,6	10	V	0,94	0,53	0,34	0,21															
		hr	11,8	2,82	1	0,25															
0,9	15	V	1,42	0,8	0,51	0,31															
		hr	25,1	6,04	2,16	0,55															
1,2	20	V	1,89	1,06	0,68	0,41	0,27														
		hr	43,1	10,4	3,72	0,95	0,31														
1,5	25	V	2,36	1,33	0,85	0,52	0,33														
		hr	64,5	15,8	5,68	1,47	0,47														
1,8	30	V	2,83	1,59	1,02	0,62	0,4														
		hr	92	22,3	8	2,09	0,66														
2,1	35	V	3,3	1,86	1,19	0,73	0,46	0,3													
		hr	123	29,8	10,8	2,81	0,89	0,31													
2,4	40	V	3,77	2,12	1,36	0,83	0,53	0,34													
		hr	164	38,2	13,8	3,65	1,15	0,4													
3	50	V	4,72	2,65	1,7	1,04	0,66	0,42													
		hr	246	58,2	21,5	5,6	1,75	0,61													
3,6	60	V		3,18	2,04	1,24	0,8	0,51													
		hr		82	30	8	2,48	0,86													
4,2	70	V		3,72	2,38	1,45	0,93	0,59													
		hr		110	40	10,8	3,33	1,14													
4,8	80	V		4,25	2,72	1,66	1,06	0,68													
		hr		141	51,5	13,9	4,3	1,46													
5,4	90	V			3,06	1,87	1,19	0,76	0,45												
		hr			64	17,5	5,4	1,82	0,46												
6	100	V			3,4	2,07	1,33	0,85	0,5												
		hr			79	21,4	6,6	2,22	0,56												
7,5	125	V			4,25	2,59	1,66	1,06	0,63												
		hr			120	33	10	3,4	0,86												
9	150	V				3,11	1,99	1,27	0,75	0,5											
		hr				47	14,2	4,74	1,21	0,43											
10,5	175	V				3,63	2,32	1,49	0,88	0,58											
		hr				63	19	6,3	1,63	0,57											
12	200	V				4,15	2,65	1,7	1,01	0,66											
		hr				82	24,5	8,1	2,1	0,74											
15	250	V				5,18	3,32	2,12	1,26	0,83	0,53										
		hr				126	37,5	12,3	3,2	1,12	0,36										
18	300	V					3,98	2,55	1,51	1	0,64										
		hr					53	17,3	4,5	1,58	0,51										
24	400	V					5,31	3,4	2,01	1,33	0,85										
		hr					92	29,5	7,8	2,7	0,89										
30	500	V					6,63	4,25	2,51	1,66	1,06	0,68									
		hr					140	44,8	12	4,13	1,36	0,48									
36	600	V						5,1	3,02	1,99	1,27	0,82									
		hr						63	16,9	5,8	1,93	0,68									
42	700	V						5,94	3,52	2,32	1,49	0,95									
		hr						84	22,6	7,8	2,6	0,9									
48	800	V						6,79	4,02	2,65	1,70	1,09	0,75								
		hr						108	29	10	3,35	1,16	0,43								
54	900	V						7,64	4,52	2,99	1,91	1,22	0,85								
		hr						134	36	12,5	4,2	1,45	0,54								
60	1000	V							5,03	3,32	2,12	1,36	0,94								
		hr							44,5	15,2	5,14	1,76	0,66								
75	1250	V							6,28	4,15	2,65	1,70	1,18	0,87							
		hr							68	23	7,9	2,68	1	0,48							
90	1500	V							7,54	4,98	3,18	2,04	1,42	1,04							
		hr							96	32,6	11,2	3,77	1,42	0,68							
105	1750	V							8,79	5,81	3,72	2,38	1,65	1,21	0,93						
		hr							129	43,5	15	5,04	1,9	0,91	0,45						
120	2000	V							6,63	4,25	2,72	1,89	1,39	1,06	0,68						
		hr							56	19,4	6,5	2,43	1,18	0,58	0,16						
150	2500	V							8,29	5,31	3,40	2,36	1,73	1,33	0,85						
		hr							85	30	9,8	3,75	1,79	0,89	0,25						
180	3000	V							9,95	6,37	4,08	2,83	2,08	1,59	1,02	0,71					
		hr							120	42	13,8	5,3	2,53	1,25	0,35	0,15					
300	5000	V								10,62	6,79	4,72	3,47	2,65	1,70	1,18	0,87	0,66			
		hr								124,9	41,3	16,74	7,81	4,03	1,34	0,54	0,25	0,13			
600	10000	V									13,59	9,44	6,93	5,31	3,4	2,36	1,73	1,33			
		hr									161	65	30,2	15,6	5,16	2,09	0,97	0,5			
1200	20000	V													6,79	4,72	3,47	2,65			
		hr													20,1	8,13	3,8	3,8			
1800	30000	V														7,7	5,2	4,0			
		hr														18,07	8,39	4,32			
3000	50000	V														11,8	8,67	6,63			
		hr														49,5	23	11,8			
4500	75000	V														17,7	13	9,9			
		hr														110,5	51,3	26,4			
6000	100000	V															17,33	13,27			
		hr															90,6	46,6			

THE FLOW RESISTANCE MUST BE MULTIPLIED BY:

- 0.8 for stainless steel pipes
- 1.25 for slightly rusted steel pipes
- 1.7 for pipes with deposits that reduce the flow section
- 0.7 for aluminium pipes
- 1.3 for fibre-cement pipes

Hr = FLOW RESISTANCE (m/100 m OF PIPELINE)
V = WATER SPEED (m/sec)

**TABLE OF FLOW RESISTANCE IN BENDS, VALVES AND GATES
IN cm OF COLUMN OF WATER**

WATER SPEED m/sec	SHARP BENDS 					SMOOTH BENDS 					STANDARD GATE VALVES	FOOT VALVES	CHECK VALVES
	a = 30°	a = 40°	a = 60°	a = 80°	a = 90°	$\frac{d}{R} = 0,4$	$\frac{d}{R} = 0,6$	$\frac{d}{R} = 0,8$	$\frac{d}{R} = 1$	$\frac{d}{R} = 1,5$			
0,10	0,03	0,04	0,05	0,07	0,08	0,007	0,008	0,01	0,0155	0,027	0,030	30	30
0,15	0,06	0,07	0,10	0,14	0,17	0,016	0,019	0,024	0,033	0,06	0,033	31	31
0,2	0,11	0,13	0,18	0,26	0,31	0,028	0,033	0,04	0,058	0,11	0,058	31	31
0,25	0,17	0,21	0,28	0,4	0,48	0,044	0,052	0,063	0,091	0,17	0,090	31	31
0,3	0,25	0,30	0,41	0,6	0,7	0,063	0,074	0,09	0,13	0,25	0,13	31	31
0,35	0,33	0,40	0,54	0,8	0,93	0,085	0,10	0,12	0,18	0,33	0,18	31	31
0,4	0,43	0,52	0,71	1,0	1,2	0,11	0,13	0,16	0,23	0,43	0,23	32	31
0,5	0,67	0,81	1,1	1,6	1,9	0,18	0,21	0,26	0,37	0,67	0,37	33	32
0,6	0,97	1,2	1,6	2,3	2,8	0,25	0,29	0,36	0,52	0,97	0,52	34	32
0,7	1,35	1,65	2,2	3,2	3,9	0,34	0,40	0,48	0,70	1,35	0,70	35	32
0,8	1,7	2,1	2,8	4,0	4,8	0,45	0,53	0,64	0,93	1,7	0,95	36	33
0,9	2,2	2,7	3,6	5,2	6,2	0,57	0,67	0,82	1,18	2,2	1,20	37	34
1,0	2,7	3,3	4,5	6,4	7,6	0,7	0,82	1,0	1,45	2,7	1,45	38	35
1,5	6,0	7,3	10	14	17	1,6	1,9	2,3	3,3	6	3,3	47	40
2,0	11	14	18	26	31	2,8	3,3	4,0	5,8	11	5,8	61	48
2,5	17	21	28	40	48	4,4	5,2	6,3	9,1	17	9,1	78	58
3,0	25	30	41	60	70	6,3	7,4	9	13	25	13	100	71
3,5	33	40	55	78	93	8,5	10	12	18	33	18	123	85
4,0	43	52	70	100	120	11	13	16	23	42	23	150	100
4,5	55	67	90	130	160	14	21	26	37	55	37	190	120
5,0	67	82	110	160	190	18	29	36	52	67	52	220	140

1) Flow resistance in bends is due to the contraction of the liquid threads resulting from the change of direction: the development of the bends must therefore be included in the length of the pipeline.

2) Flow resistance in valves and gates was determined on the basis of practical tests.

VOLUMETRIC CAPACITY

litres per minute l/min	cubic metres per hour m ³ /h	cubic feet per hour ft ³ /h	cubic feet per minute ft ³ /min	imp. gal. per minute imp. gal./min	US gal. per minute US gal./min
1,000	0,0600	2,1189	0,0353	0,2200	0,2640
16,6670	1,0000	35,3147	0,5886	3,6660	4,4030
0,4720	0,0283	1,0000	0,0167	0,1040	0,1250
28,3170	1,6990	60,0000	1,0000	6,2290	7,4800
4,5460	0,2728	9,6326	0,1605	1,0000	1,2010
3,7850	0,2271	8,0209	0,1337	0,8330	1,0000
0,1100	0,0066	0,2339	0,0039	0,0240	0,0290

PRESSURE AND HEAD

Newton per square metre N/m ²	kiloPascal kPa	bar bar	pound force per square inch psi	metre of water m H ₂ O	millimetre of mercury mm Hg
1,0000	0,0010	1 x 10 ⁵	1,45 x 10 ⁻⁴	1,02 x 10 ⁻⁴	0,0075
1.000,0000	1,0000	0,0100	0,1450	0,1020	7,5000
100.000,0000	100,0000	1,0000	14,5000	10,2000	750,1000
98.067,0000	98,0700	0,9810	14,2200	10,0000	735,6000
6.895,0000	6,8950	0,0690	1,0000	0,7030	51,7200
2.984,0000	2,9840	0,0300	0,4330	0,3050	22,4200
9.789,0000	9,7890	0,0980	1,4200	1,0000	73,4200
133,3000	0,1330	0,0013	0,0190	0,0140	1,0000
3.386,0000	3,3860	0,0338	0,4910	0,3450	25,4000

LENGTH

millimetre mm	centimetre cm	metre m	inch in	foot ft	yard yd
1,0000	0,1000	0,0010	0,0394	0,0033	0,0011
10,0000	1,0000	0,0100	0,3937	0,0328	0,0109
1000,0000	100,0000	1,0000	39,3701	3,2808	1,0936
25,4000	2,5400	0,0254	1,0000	0,0833	0,0278
304,8000	30,4800	0,3048	12,0000	1,0000	0,3333
914,4000	91,4400	0,9144	36,0000	3,0000	1,0000

VOLUME

cubic metre m ³	litre l	millilitre ml	imp. gallon imp. gal.	US gallon US gal	cubic foot ft ³
1,0000	1.000,0000	1 x 10 ⁶	220,0000	264,2000	35,3147
0,0010	1,0000	1.000,0000	0,2200	0,2642	0,0353
1 x 10 ⁻⁶	0,0010	1,0000	2,2 x 10 ⁻⁴	2,642 x 10 ⁻⁴	3,53 x 10 ⁻⁵
0,0045	4,5460	4.546,0000	1,0000	1,2010	0,1605
0,0038	3,7850	3.785,0000	0,8327	1,0000	0,1337
0,0283	28,3170	28.317,0000	6,2288	7,4805	1,0000

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