Performance range

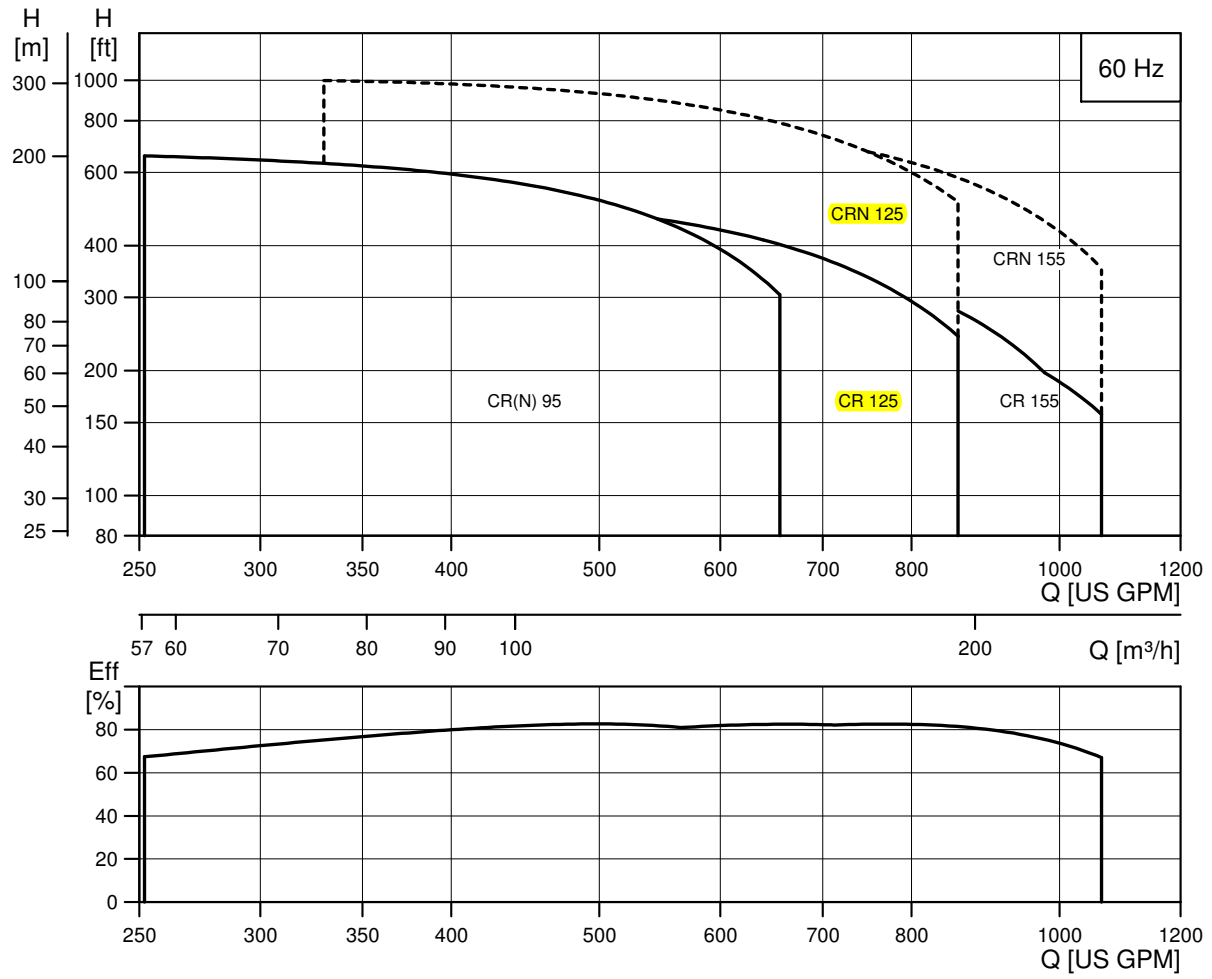


Fig. 2 Performance range, CR, CRN

Product range

Range	CR, CRN 95	CR, CRN 125	CR, CRN 155
Rated flow rate [US gpm (m^3/h)]	500 (114)	660 (150)	820 (186)
Liquid temperature [°F (°C)]	-22 to +248[1] (-30 to +120)		
Maximum pump efficiency [%]	82.5	82.5	82.5
CR, CRN pumps			
Flow rate [US gpm]	255-660	330-860	410-1060
Maximum pressure [psi (bar)]	537[2] (37)	566[2] (39)	580[2] (40)
Motor power [Hp (kW)]	20-75 (15-55)	20-150 (15-111)	25-150 (18-111)
Version			
CR: Cast iron and stainless steel EN 1.4301/AISI 304	•	•	•
CRN: Stainless steel EN 1.4401/AISI 316	•	•	•
CR pipe connection			
Flange	4" ANSI	6" ANSI	
CRN pipe connection			
Flange	4" ANSI	6" ANSI	
PJE coupling (Victaulic type)	4"	6"	

1) CRN 95 to 155 with HQQE shaft seal: -40 to +248 °F (-40 to +120 °C).

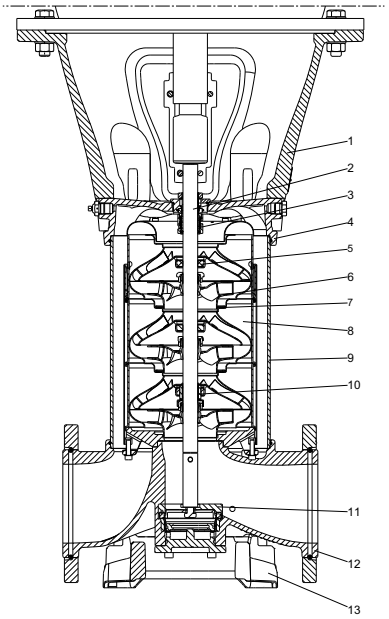
2) CR pumps: Maximum operating pressure is 363 psi (25 bar).

2. Construction

CR 95, 125 and 155

ANSI flange

TM06 9206 1917



TM06 5161 1917

Materials, CR

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
2	Shaft	Stainless steel	EN10088 1.4057[1)] EN10088 1.4462[2)]	EN10088 1.4057=431 EN10088 1.4462=318 LN
3	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
4	Pump head	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
5	Support bearing (bush)	Carbon-graphite filled PTFE		
6	Impeller	Stainless steel	EN10088 1.4301	AISI 304
7	Neck ring	PEEK	-	-
8	Chamber	Stainless steel	EN10088 1.4301	AISI 304
9	Sleeve	Stainless steel	EN10088 1.4301[1)] EN10088 1.4404[2)]	AISI 304[1)] AISI 316 L[2)]
10	Bearing ring	Tungsten carbide/Tungsten carbide	-	-
11	Thrust handling device[3)]	Stainless steel	EN10088 1.4401 EN10283 1.4408	AISI 316/CF 8M
		Silicon carbide/Tungsten carbide	-	-
12	Base	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
13	Base plate	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
	Rubber parts	EPDM or FKM	-	-

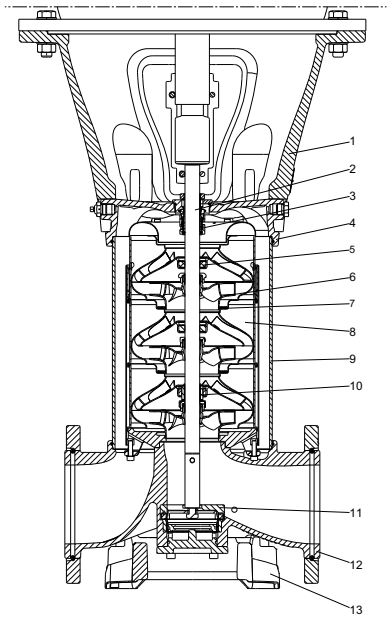
1) Applies to CR 95.
2) Applies to CR 125 to CR 155.
3) Only fitted on pumps with 100 Hp (75 kW) motors or larger.

CRN 95, 125 and 155

ANSI flange

PJE (Victaulic type)

TM06 9203 1917 - TM06 9208 1917 - TM06 921 01917



TM06 5161 1917

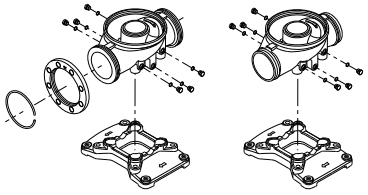
Materials, CRN

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
2	Shaft	Stainless steel	EN10088 1.4462	318 LN
3	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
4	Pump head	Stainless steel	EN10283 1.4408	CF 8M
5	Support bearing (bush)	Carbon-graphite filled PTFE	-	-
6	Impeller	Stainless steel	EN10088 1.4401	AISI 316
7	Neck ring	PEEK	-	-
8	Chamber	Stainless steel	EN10088 1.4401	AISI 316
9	Sleeve	Stainless steel	EN10088 1.4404	AISI 316 L
10	Bearing ring	Tungsten carbide/Tungsten carbide	-	-
11	Thrust handling device[1)]	Stainless steel	EN10088 1.4401 EN10283 1.4408	AISI 316/CF 8M
		Silicon carbide/Tungsten carbide	-	-
12	Base	Stainless steel	EN10283 1.4408	CF 8M
13	Base plate	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
	Rubber parts	EPDM or FKM	-	-

1) Only fitted on pumps with 100 Hp (75 kW) motors or larger.

3. Operating and inlet pressures

Max. operating pressure and liquid temperature

Pump type	ANSI, PJE (Victaulic type)		
	 TM06 9402 2417		
	Pressure class	**Maximum permissible operating pressure in standard configuration [psi (bar)]**	**Liquid temperature [°F (°C)]**
CR 95-1-1 → 95-4-1	150	363 (25) Note: CRN models may be configured for up to 580 psi (40 bar) (depending on model). Please contact Grundfos.	-22 to 248 (-30 to 120)
CR 95-4 → 95-5-1	300		
CR 125-1-1 → 125-3	150		
CR 125-4-2	300		
CR 155-1-1 → 155-3-2	150		
CRN 95-1-1 → 95-4-1	150		-40 to 248 (-40 to 120)*
CRN 95-5-2 → 95-5-1	300		
CRN 125-1-1 → 125-3	150		
CRN 125-4-2 → 125-7-2	300		
CRN 155-1-1 → 155-3-2	150		
CRN 155-3-1 → 155-5-1	300		

* For operating pressures above 435 psi (30 bar) the liquid temperature limits are -40 to 176 °F (-40 to 80 °C).

Operating range of the shaft seal

All pumps will be delivered with a HQQE/V cartridge shaft seal as standard.

The operating range of the shaft seal depends on operating pressure, pump type, type of shaft seal and liquid temperature. The range shown in figs 5 and 6 applies to clean water and water with anti-freeze liquids. For selection of the right shaft seal, see *List of pumped liquids*, page 31. If the operating range is exceeded, the life of the shaft seal may be reduced.

CR, CRN 95-155

Shaft seals for Ø22 mm shafts (15 to 75 Hp (55 kW))

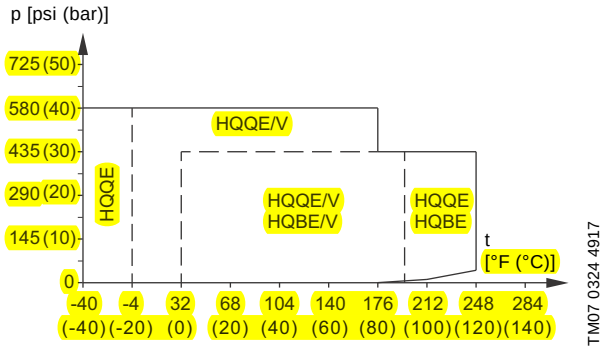


Fig. 5 Operating range of standard shaft seals for CR, CRN 95-155

Standard shaft seal	Motor size [Hp (kW)]	Description	Liquid temperature [°F (°C)]
HQQE	15-75 (11-55)	O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, EPDM	-40 - +248 (-40 - +120)
HQQV		O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, FKM	-4 - +194 (-20 - +90)
HQBE		O-ring (cartridge) (balanced seal), Silicon carbide/carbon, EPDM	32 - +248 (0 - +120)
HQBV		O-ring (cartridge) (balanced seal), Silicon carbide/carbon, FKM	32 - +194 (0 - +90)

Shaft seals for Ø28 mm (100-150 Hp (75-110 kW)) and Ø36 mm (200-300 Hp (132-200 kW)) shaft ends

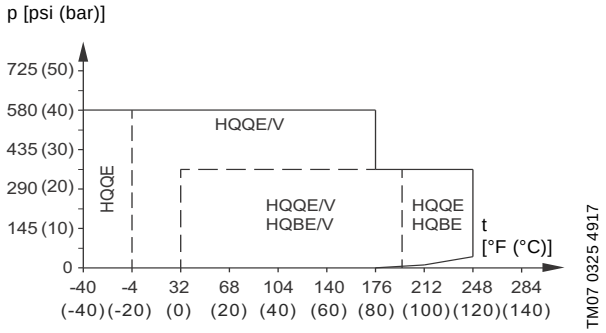


Fig. 6 Operating range of standard shaft seals for Ø28 mm shaft ends (100-150 Hp (75-110 kW)) and Ø36 mm shaft ends (200-300 Hp) 132-200 kW))

Standard shaft seal	Motor size [Hp (kW)]	Description	Liquid temperature [°F (°C)]
HQQE	100-300 (75-200)	O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, EPDM	-40 - +248 (-40 - +120)
HQQV		O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, FKM	-4 - +194 (-20 - +90)
HQBE		O-ring (cartridge) (balanced seal), Silicon carbide/carbon, EPDM	32 - +248 (0 - +120)
HQBV		O-ring (cartridge) (balanced seal), Silicon carbide/carbon, FKM	32 - +194 (0 - +90)

Maximum inlet pressure

The following table shows the maximum permissible inlet pressure. However, the actual inlet pressure plus the pressure against a closed valve must always be lower than the maximum permissible operating pressure.

If the maximum permissible operating pressure is exceeded, the angular contact bearing in the motor may be damaged and the life of the shaft seal reduced.

Pump type	Maximum inlet pressure [psi (bar)]
CR, CRN 95	
CR, CRN 95-1-1 → CR, CRN 95-2-2	145 (10)
CR, CRN 95-2-1 → CR, CRN 95-4-2	218 (15)
CR, CRN 95-4 → CR, CRN 95-8	290 (20)
CR, CRN 125	
CR, CRN 125-1-1 → CR, CRN 125-1	145 (10)
CR, CRN 125-2-2 → CR, CRN 125-3-1	218 (15)
CR, CRN 125-3 → CR, CRN 125-9-3	290 (20)
CR, CRN 155	
CR, CRN 155-1-1	145 (10)
CR, CRN 155-1 → CR, CRN 155-2	218 (15)
CR, CRN 155-3 → CR, CRN 155-8-3	290 (20)

Examples of operating and inlet pressures

The values for operating and inlet pressures shown in the table must not be considered individually and must comply with the below statement.

The outlet pressure must be equal to or lower than the maximum operating pressure.

See the following definitions and examples.

Definitions

Pressure type	Definition
Maximum operating pressure	The maximum pressure is stated on the nameplate.
Pump differential pressure	The difference between the outlet pressure and inlet pressure.
Inlet pressure	The pressure measured at the pump inlet.
Outlet pressure	The inlet pressure added to the pump differential pressure.

Example

The following pump type has been selected: CR 95-3.

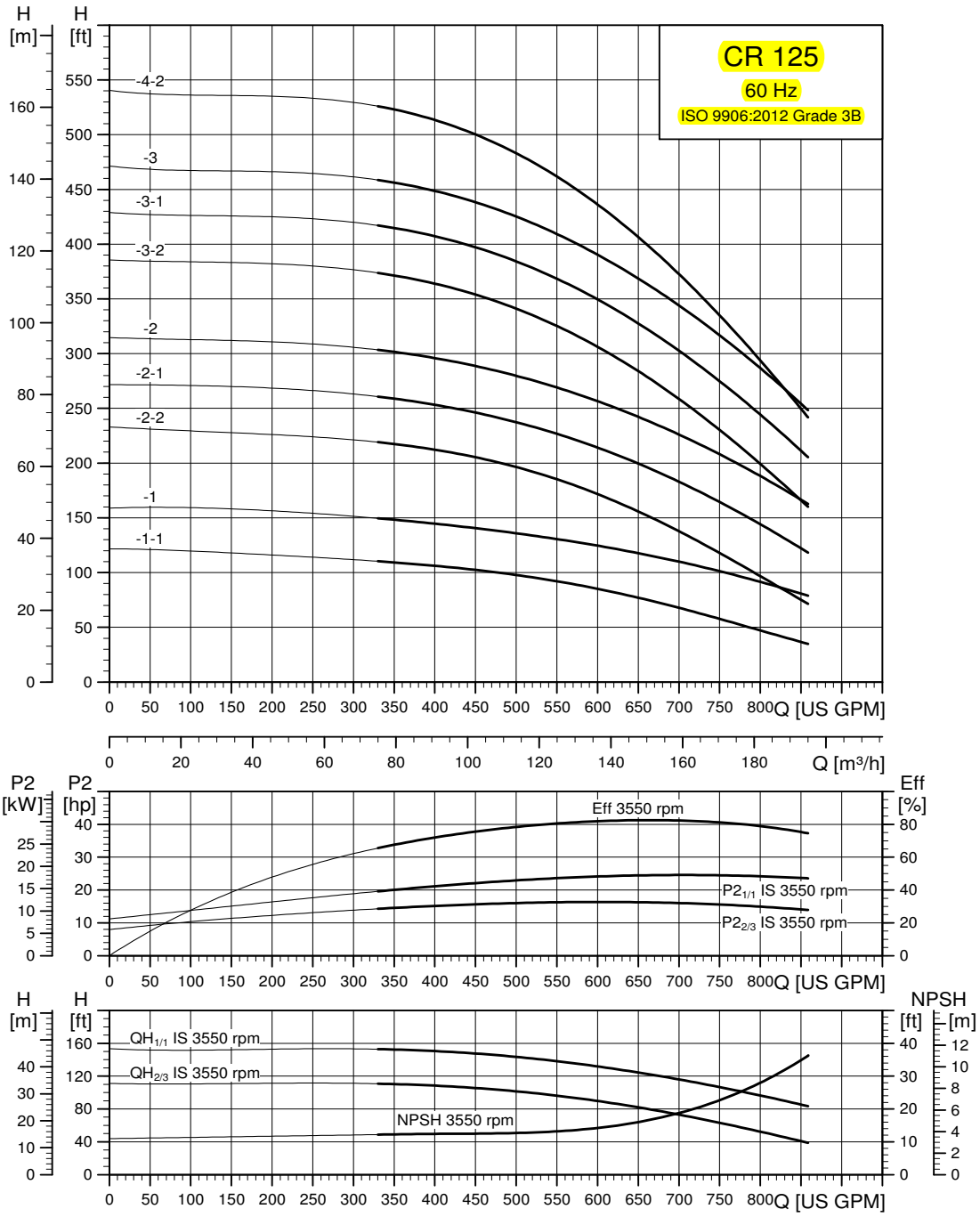
Maximum operating pressure: 363 psi (25 bar).

Maximum inlet pressure: 218 psi (15 bar).

Pump differential pressure when operating against a closed outlet valve (flow = 0 GPM (0 m^3/h)): 436 ft head = 190 psi (133 m head = 13.07 bar). See page 18.

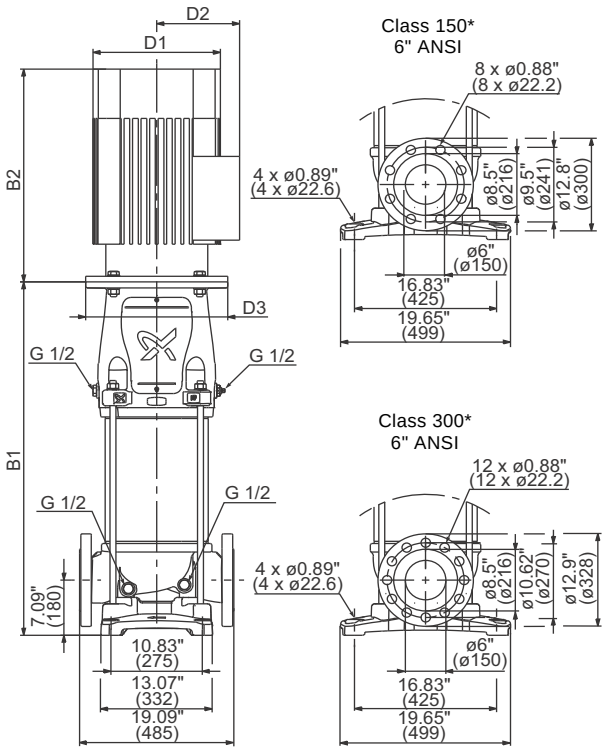
This pump is **not** allowed to start at an inlet pressure of 218 psi (15 bar), but at an inlet pressure of 363 - 190 = 173 psi (25 - 13.07 = 11.93 bar)

CR 125



TM06 5539 3718

The maximum pump efficiency (Eta) is based on a three-stage pump.



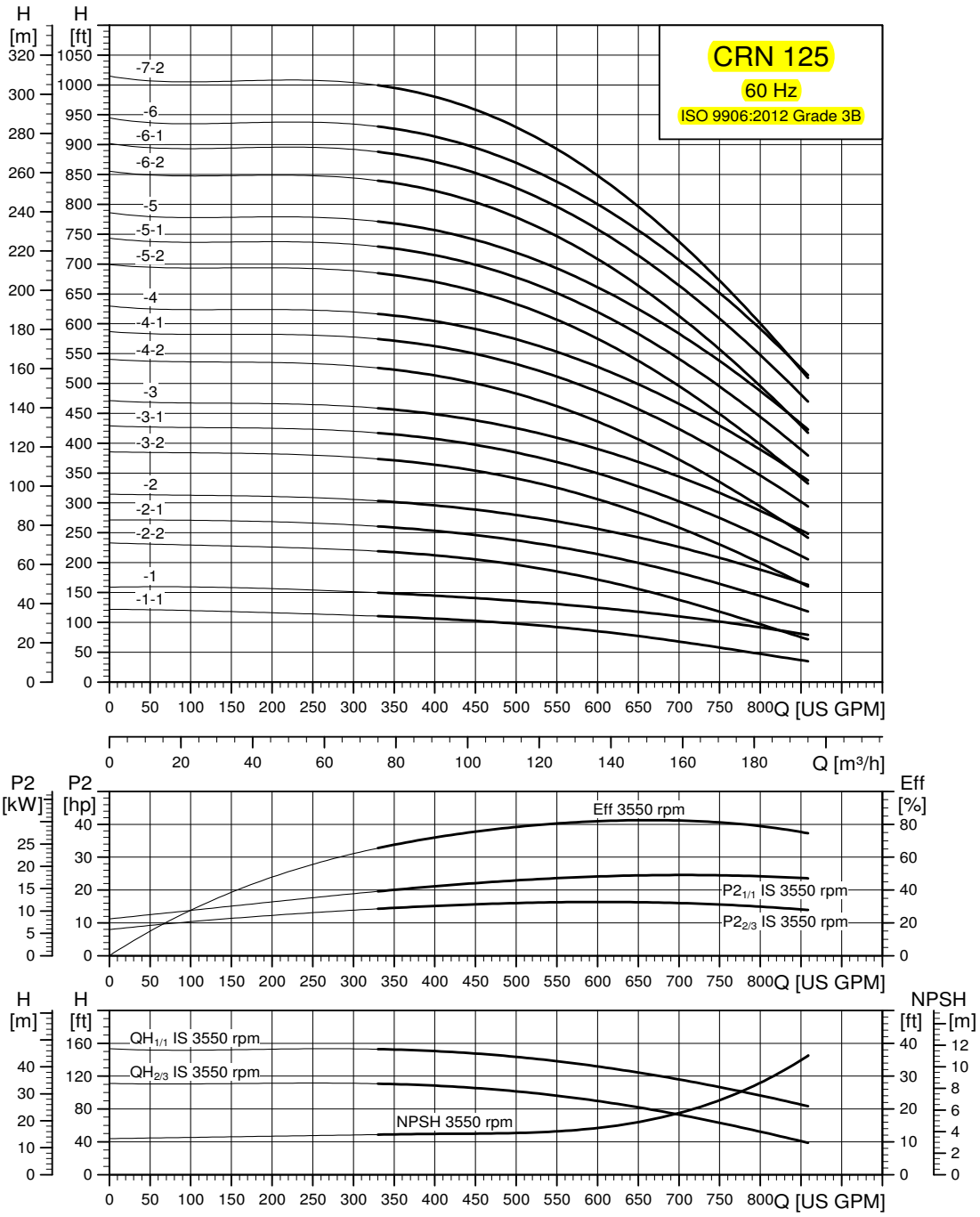
TM06 6061 0218

* CR, CRN 125 pumps with 1 to 3 stages are fitted with 150 lb. (68 kg) flanges as standard. 300 lb. (136 kg) flanges are available on request.
CR, CRN 125 pumps with 4 or more stages are fitted with 300 lb. (136 kg) flanges as standard.

Dimensions and weights

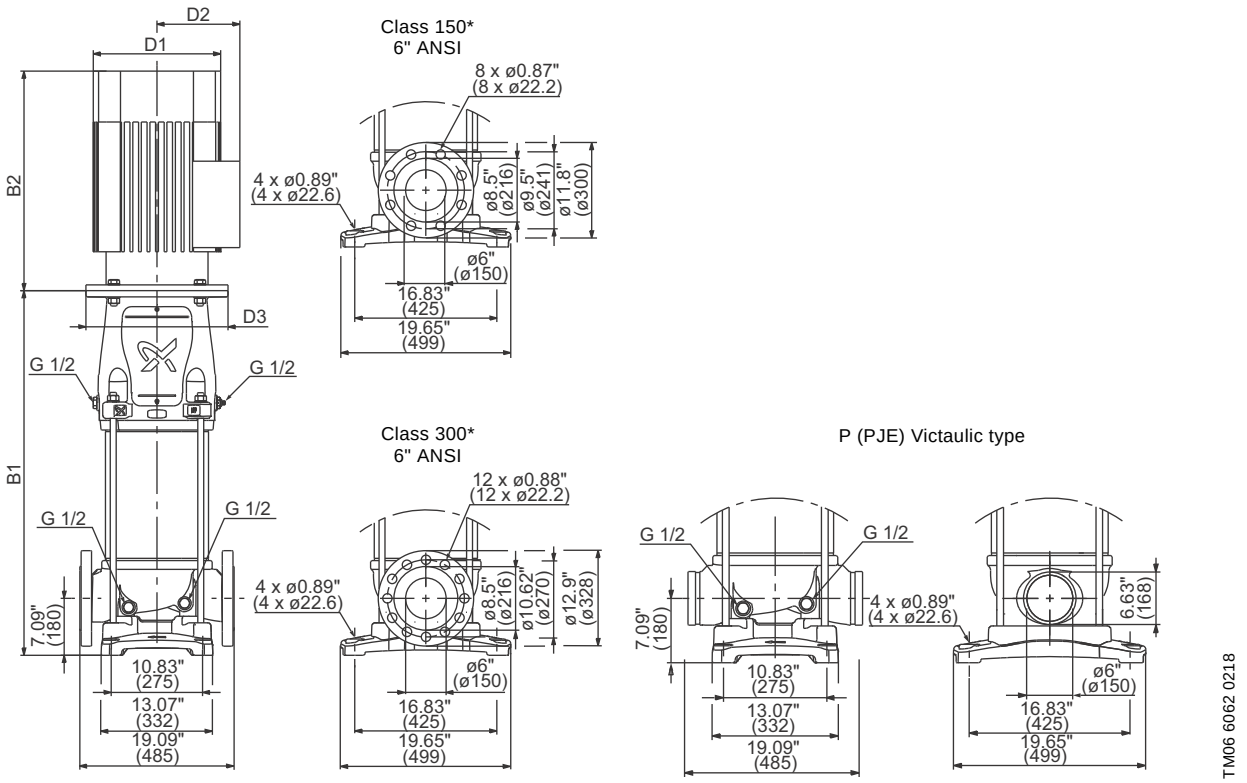
Pump type	Motor P_2 [Hp (kw)]	Dimension [inch (mm)]					Net weight [lbs (kg)]
		B1	B1+B2	D1	D2	D3	
CR 125-1-1	20 (15)	30.8 (783)	49.6 (1261)	12.4 (314)	8 (204)	8.5 (216)	478 (217)
CR 125-1	25 (18)	30.9 (785)	53.7 (1363)	12.4 (314)	8 (204)	10.5 (267)	518 (235)
CR 125-2-2	30 (22)	35.7 (907)	58.5 (1485)	12.4 (314)	8 (204)	10.5 (267)	569 (258)
CR 125-2-1	40 (30)	36.6 (930)	64.2 (1630)	16.9 (429)	14.1 (359)	12.5 (318)	820 (372)
CR 125-2	50 (37)	36.6 (930)	64.2 (1630)	16.9 (429)	14.1 (359)	12.5 (318)	888 (403)
CR 125-3-2	60 (45)	41.4 (1052)	68.5 (1739)	16.9 (429)	14.1 (359)	12.5 (318)	961 (436)
CR 125-3-1	75 (56)	41.4 (1052)	69 (1752)	19.7 (500)	18.1 (460)	12.5 (318)	1281 (581)
CR 125-3	75 (56)	41.4 (1052)	69 (1752)	19.7 (500)	18.1 (460)	12.5 (318)	1281 (581)
CR 125-4-2	75 (56)	46.2 (1174)	73.8 (1874)	19.7 (500)	18.1 (460)	12.5 (318)	1303 (591)

CRN 125



TM06 5540 3718

The maximum pump efficiency (Eta) is based on a three-stage pump.



* CR, CRN 125 pumps with 1 to 3 stages are fitted with 150 lb. (68 kg) flanges as standard. 300 lb. (136 kg) flanges are available on request.
CR, CRN 125 pumps with 4 or more stages are fitted with 300 lb. (136 kg) flanges as standard.

Dimensions and weights

Pump type	Motor P_2 [Hp (kW)]	Dimension [inch (mm)]					Net weight [lbs (kg)]
		B1	B1+B2	D1	D2	D3	
CRN 125-1-1	20 (15)	30.8 (783)	49.6 (1261)	12.4 (314)	8 (204)	8.5 (216)	478 (217)
CRN 125-1	25 (18)	30.9 (785)	53.7 (1363)	12.4 (314)	8 (204)	10.5 (267)	518 (235)
CRN 125-2-2	30 (22)	35.7 (907)	58.5 (1485)	12.4 (314)	8 (204)	10.5 (267)	569 (258)
CRN 125-2-1	40 (30)	36.6 (930)	64.2 (1630)	16.9 (429)	14.1 (359)	12.5 (318)	820 (372)
CRN 125-2	50 (37)	36.6 (930)	64.2 (1630)	16.9 (429)	14.1 (359)	12.5 (318)	888 (403)
CRN 125-3-2	60 (45)	41.4 (1052)	68.5 (1739)	16.9 (429)	14.1 (359)	12.5 (318)	961 (436)
CRN 125-3-1	75 (56)	41.4 (1052)	69 (1752)	19.7 (500)	18.1 (460)	12.5 (318)	1281 (581)
CRN 125-3	75 (56)	41.4 (1052)	69 (1752)	19.7 (500)	18.1 (460)	12.5 (318)	1281 (581)
CRN 125-4-2	75 (56)	46.2 (1174)	73.8 (1874)	19.7 (500)	18.1 (460)	12.5 (318)	1303 (591)
CRN 125-4-1	100 (75)	46.1 (1172)	82.2 (2087)	22.2 (565)	19.2 (488)	18 (457)	1781 (808)
CRN 125-4	100 (75)	46.1 (1172)	82.2 (2087)	22.2 (565)	19.2 (488)	18 (457)	1781 (808)
CRN 125-5-2	100 (75)	50.9 (1294)	87 (2209)	22.2 (565)	19.2 (488)	18 (457)	1803 (818)
CRN 125-5-1	125 (93)	50.9 (1294)	90.6 (2300)	26.5 (673)	22.7 (576)	18 (457)	2255 (1023)
CRN 125-5	125 (93)	50.9 (1294)	90.6 (2300)	26.5 (673)	22.7 (576)	18 (457)	2255 (1023)
CRN 125-6-2	125 (93)	55.7 (1416)	95.4 (2422)	26.5 (673)	22.7 (576)	18 (457)	2280 (1034)
CRN 125-6-1	150 (112)	55.7 (1416)	95.4 (2422)	26.5 (673)	22.7 (576)	18 (457)	2511 (1139)
CRN 125-6	150 (112)	55.7 (1416)	95.4 (2422)	26.5 (673)	22.7 (576)	18 (457)	2511 (1139)
CRN 125-7-2	150 (112)	60.6 (1538)	100.2 (2544)	26.5 (673)	22.7 (576)	18 (457)	2533 (1149)

6. Motor data

Standard motors, 60 Hz

Baldor motor

Grundfos motor

TM06 6898 2616 - GR7845

Motor P2 [Hp (kW)]	Frame size	Standard voltage [V]	$I_{1/1}$ [A]	Service factor	Cos $\varphi_{1/1}$	Efficiency class	η [%]	I_{start} [A]	Speed [rpm]	Motor brand
15 (11)	254TC	208-230DD/ 460D	37.5-34/17	1.15	0.91-0.89	NEMA Premium / IE3 60Hz	IE3 91.0%	255-306/153	3490-3530	Grundfos
20 (15)	254TC	208-230DD/ 460D	50.5-46/23	1.15	0.92-0.90	NEMA Premium / IE3 60Hz	IE3 91.0%	308-373/186	3490-3530	
25 (19)	284TSC	208-230DD/ 460D	62-56/28	1.15	0.92-0.91	NEMA Premium / IE3 60Hz	IE3 91.7%	341-420/210	3490-3530	
30 (22)	286TSC	208-230DD/ 460D	74-67/33.5	1.15	0.92-0.91	NEMA Premium / IE3 60Hz	IE3 91.7%	400-489/245	3490-3530	
40 (30)	324TSC	230/460	90/45	1.15	0.86	NEMA Premium / IE3 60Hz	IE3 92.4%	564/326	3540	Baldor
50 (37)	326TSC	230/460	112/56	1.15	0.87	NEMA Premium / IE3 60Hz	IE3 93.0%	688/398	3540	
60 (45)	364TSC	230/460	132/66	1.15	0.87	NEMA Premium / IE3 60Hz	IE3 93.6%	989/572	3550	
75 (56)	365TSC	230/460	166/83	1.15	0.87	NEMA Premium / IE3 60Hz	IE3 93.6%	1210/700	3550	
100 (75)	405TSD	460	110	1.15	0.90	NEMA Premium / IE3 60Hz	IE3 94.1%	695	3565	
125 (93)	444TSD	460	137	1.15	0.90	NEMA Premium / IE3 60Hz	IE3 95.0%	848	3565	
150 (112)	445TSD	460	166	1.15	0.89	NEMA Premium / IE3 60Hz	IE3 95.0%	978	3575	

Pumped liquid	Chemical formula	Note	Liquid concentration, liquid temperature	CR	CRN
Acetic acid	CH_3COOH	-	5 %, 68 °F (20 °C)	-	HQQE
Acetone	CH_3COCH_3	1, F	100 %, 68 °F (20 °C)	-	HQQE
Alkaline degreasing agent		D, F	-	HQQE	-
Ammonium bicarbonate	NH_4HCO_3	E	20 %, 86 °F (86 °F (30 °C))	-	HQQE
Ammonium hydroxide	NH_4OH	-	20 %, 104 °F (40 °C)	HQQE	-
Aviation fuel		1, 3, 4, F	100 %, 68 °F (20 °C)	HQBV	-
Benzoic acid	C_6H_5COOH	H	0.5 %, 68 °F (20 °C)	-	HQQV
Boiler water		-	< 248 °F (120 °C)	HQQE	-
		F	248-356 °F (120-180 °C)	-	-
Calcareous water		-	< 194 °F (90 °C)	HQQE	-
Calcium acetate (as coolant with inhibitor)	$Ca(CH_3COO)_2$	D, E	30 %, 122 °F (50 °C)	HQQE	-
Calcium hydroxide	$Ca(OH)_2$	E	Saturated solution, 122 °F (50 °C)	HQQE	-
Chloride-containing water		F	< 86 °F (30 °C), maximum 500 ppm	-	HQQE
Chromic acid	H_2CrO_4	H	1 %, 68 °F (20 °C)	-	HQQV
Citric acid	$HOC(CH_2CO_2H)_2COOH$	H	5 %, 104 °F (40 °C)	-	HQQE
Completely desalinated water (demineralized water)		-	248 °F (120 °C)	-	HQQE
Condensate		-	248 °F (120 °C)	HQQE	-
Copper sulphate	$CuSO_4$	E	10 %, 122 °F (50 °C)	-	HQQE
Corn oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Diesel oil		2, 3, 4, F	100 %, 68 °F (20 °C)	HQBV	-
Domestic hot water (potable water)		-	< 248 °F (120 °C)	HQQE	-
Ethanol (ethyl alcohol)	C_2H_5OH	1, F	100 %, 68 °F (20 °C)	HQQE	-
Ethylene glycol	$HOCH_2CH_2OH$	D, E	50 %, 122 °F (50 °C)	HQQE	-
Formic acid	$HCOOH$	-	5 %, 68 °F (20 °C)	-	HQQE
Glycerine (glycerol)	$OHCH_2CH(OH)CH_2OH$	D, E	50 %, 122 °F (50 °C)	HQQE	-
Hydraulic oil (mineral)		E, 2, 3	100 %, 212 °F (100 °C)	HQQV	-
Hydraulic oil (synthetic)		E, 2, 3	100 %, 212 °F (100 °C)	HQQV	-
Isopropyl alcohol	$CH_3CHOHCH_3$	1, F	100 %, 68 °F (20 °C)	HQQE	-
Lactic acid	$CH_3CH(OH)COOH$	E, H	10 %, 68 °F (20 °C)	-	HQQV
Linoleic acid	$C_{17}H_{31}COOH$	E, 3	100 %, 68 °F (20 °C)	HQQV	-
Methanol (methyl alcohol)	CH_3OH	1, F	100 %, 68 °F (20 °C)	HQQE	-
Motor oil		E, 2, 3	100 %, 176 °F (80 °C)	HQQV	-
Naphthalene	$C_{10}H_8$	E, H	100 %, 176 °F (80 °C)	HQQV	-
Nitric acid	HNO_3	F	1 %, 68 °F (20 °C)	-	HQQE
Oil-containing water		-	< 212 °F (100 °C)	HQQV	-
Olive oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Oxalic acid	$(COOH)_2$	H	1 %, 68 °F (20 °C)	-	HQQE
Ozone-containing water	(O_3)	-	< 212 °F (100 °C)	-	HQQE
Peanut oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Petrol		1, 3, 4, F	100 %, 68 °F (20 °C)	HQBV	-
Phosphoric acid	H_3PO_4	E	20 %, 68 °F (20 °C)	-	HQQE
Propanol	C_3H_7OH	1, F	100 %, 68 °F (20 °C)	HQQE	-
Propylene glycol	$CH_3CH(OH)CH_2OH$	D, E	50 %, 194 °F (90 °C)	HQQE	-
Potassium carbonate	K_2CO_3	E	20 %, 122 °F (50 °C)	HQQE	-
Potassium formate (as coolant with inhibitor)	$KOOCH$	D, E	30 %, 122 °F (50 °C)	HQQE	-
Potassium hydroxide	KOH	E	20 %, 122 °F (50 °C)	-	HQQE
Potassium permanganate	$KMnO_4$	-	5 %, 68 °F (20 °C)	-	HQQE
Rape seed oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Salicylic acid	$C_6H_4(OH)COOH$	H	0.1 %, 68 °F (20 °C)	-	HQQE
Silicone oil		E, 3	100 %	HQQV	-
Sodium bicarbonate	$NaHCO_3$	E	10 %, 140 °F (60 °C)	-	HQQE
Sodium chloride (as coolant)	$NaCl$	D, E	30 %, < 41 °F (5 °C), pH > 8	HQQE	-
Sodium hydroxide	$NaOH$	E	20 %, 122 °F (50 °C)	-	HQQE
Sodium hypochlorite	$NaOCl$	F	0.1 %, 68 °F (20 °C)	-	HQQV
Sodium nitrate	$NaNO_3$	E	10 %, 140 °F (60 °C)	-	HQQE
Sodium phosphate	Na_3PO_4	E, H	10 %, 140 °F (60 °C)	-	HQQE
Sodium sulphate	Na_2SO_4	E, H	10 %, 140 °F (60 °C)	-	HQQE
Softened water		-	< 248 °F (120 °C)	-	HQQE
Soya oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Sulphuric acid	H_2SO_4	F	1 %, 68 °F (20 °C)	-	HQQV
Sulphurous acid	H_2SO_3	-	1 %, 68 °F (20 °C)	-	HQQE
Unsalted swimming-pool water		-	Approx. 2 ppm free chlorine (Cl_2)	HQQE	-