CR, CRN High Pressure

Vertical multistage centrifugal pumps
60 Hz

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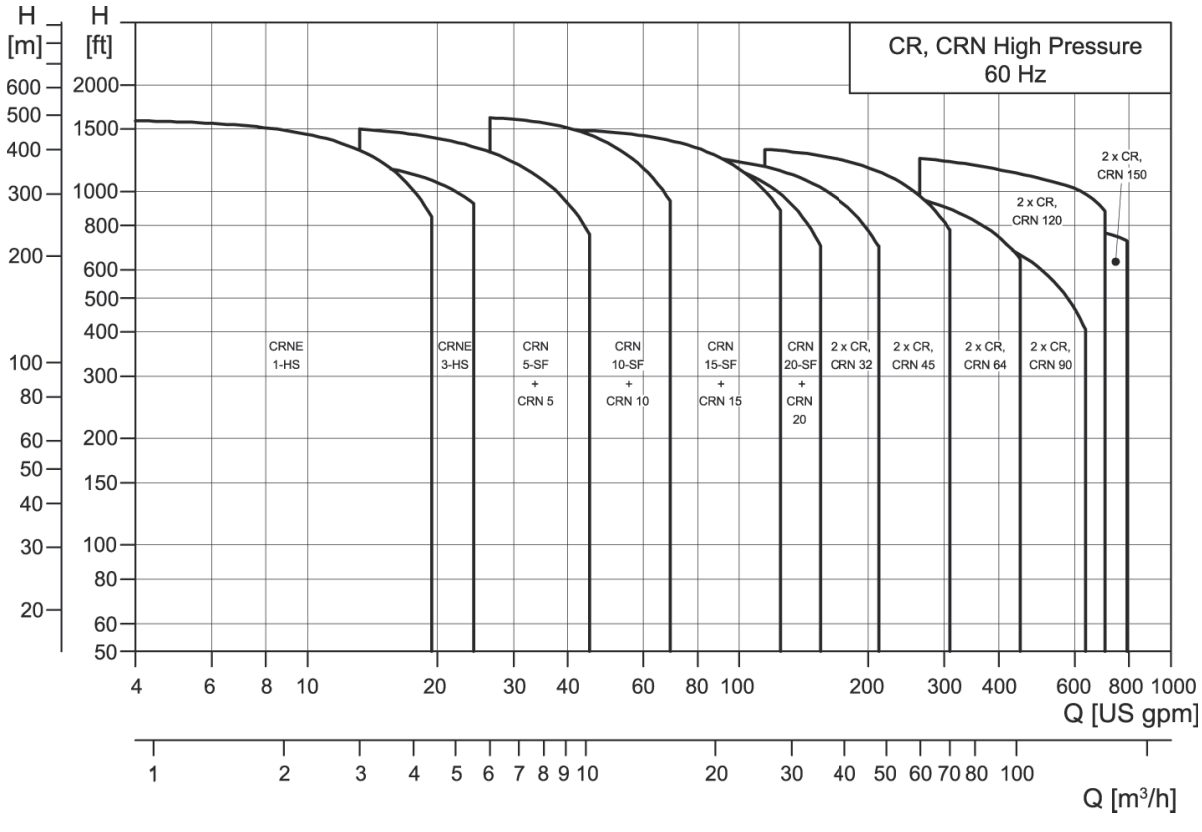
Table of contents

1. Product overview

Performance range



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Product range

Range	CRNE 1 HS	CRNE 3 HS	CRN 5 SF	CRN 10 SF	CRN 15 SF	CRN 20 SF	CRN32 SF	CRN45 SF	CRN64 SF	CRN90 SF	2 x CR(N) 120	2 x CR(N) 150
Nominal flow rate [US gpm]	13	16	30	55	95	110	140	220	340	440	610	750
Flow range [US gpm]	1.3 - 19.3	1.6 - 24	3 - 45	5.5 - 70	9.5 - 125	11 - 155	14 - 210	22 - 310	34 - 450	44 - 630	61 - 700	75 - 790
Max. working pressure [psi]	725	725	725	725	725	725	725	725	725	725	580	580
Motor power [Hp]	6.2 - 10	6.2 - 10	1.5 - 7.5	3 - 15	5 - 25	5 - 25	15 - 40	15 - 60	15 - 50	20 - 50	20 - 100	25 - 100
Temperature range [°F]	-4 to +248			-4 to +248			-22 to +248				-22 to 248 [1) 2)]	
Version												
CR: Ductile iron and stainless steel AISI 304	-	-	-	-	-	-	-	-	-	-	●	●
CRN, CRNE: Stainless steel AISI 316	●	●	●	●	●	●	●	●	●	●	●	●
CR, CR pipe connection												
ANSI flange size	-	-	-	-	-	-	-	-	-	-	5"	5"
ANSI flange class	-	-	-	-	-	-	-	-	-	-	150/300 lb.	150/300 lb.
CRN, CRNE pipe connection												
PJE (Victaulic)	1 1/4"	1 1/4"	1 1/4"	2"	2"	2"	3"	4"	4"	4"	-	-
PJE (Victaulic) - on request	-	-	-	-	-	-	-	-	-	-	4"	4"
ANSI flange size	-	-	-	-	-	-	-	-	-	-	5"	5"
ANSI flange class	-	-	-	-	-	-	-	-	-	-	150/300 lb.	150/300 lb.
System												
One pump with TEFC/ODP motor	-	-	-	-	-	-	-	-	-	-	-	-
One pump with high speed motor	●	●	-	-	-	-	-	-	-	-	-	-
Two pumps in series	-	-	●	●	●	●	●	●	●	●	●	●

● Available

'' - '' Not available

1) CR, CRN 120 and 150 with HQQE shaft seal: -40 °F to +250 °F

2) CR, CRN 120 and 150 with 75 or 100 hp motors with HBQE shaft seal: 0 °F to +250 °F

Product range

Range	CR(N)32	CR(N)45	CR(N)64	CR(N)90
Nominal flow rate [US gpm]	140	220	340	440
Flow range [US gpm]	14 - 210	22 - 310	34 - 450	44 - 630
Max. working pressure [psi]	580	580	580	580
Motor power [Hp]	50 - 60	15 - 60	25 - 60	25 - 60
Temperature range [°F]	-22 to +248			
Version				
CR: Ductile iron and stainless steel AISI 304	●	●	●	●
CRN, CRNE: Stainless steel AISI 316	●	●	●	●
CR, CR pipe connection				
ANSI flange size	2 1/2"	3"	4"	4"
ANSI flange class	300 lb.	150/300 lb.	150/300 lb.	150/300 lb.
CRN, CRNE pipe connection				
PJE (Victaulic)	-	-	-	-
PJE (Victaulic) - on request	3"	4"	4"	4"
ANSI flange size	2 1/2"	3"	4"	4"
ANSI flange class	300 lb.	150/300 lb.	150/300 lb.	150/300 lb.
System				
One pump with TEFC/ODP motor	●	-	-	-
One pump with high speed motor	-	-	-	-
Two pumps in series	-	●	●	●

● Available

‘’ - ‘’ Not available

Applications

The CR, CRN high pressure series is a multi-purpose pump range suitable for a variety of different applications demanding reliable and cost-efficient supply. CR, CRN handles a variety of liquids from potable water to industrial liquids within a very wide temperature, flow and pressure scale. Below is a list representing some general examples of applications requiring a high pressure:

Industry

Pressure boosting

- process water systems
- washing and cleaning systems
- high-pressure washdown systems
- boiler feed and condensate systems

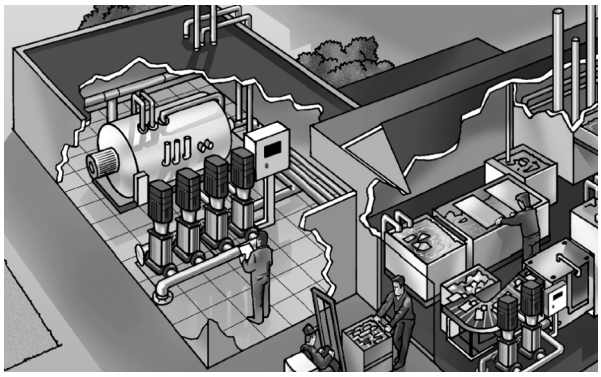

Fig. 1 Industrial application

Water treatment

- Ultra-filtration systems
- Reverse osmosis systems

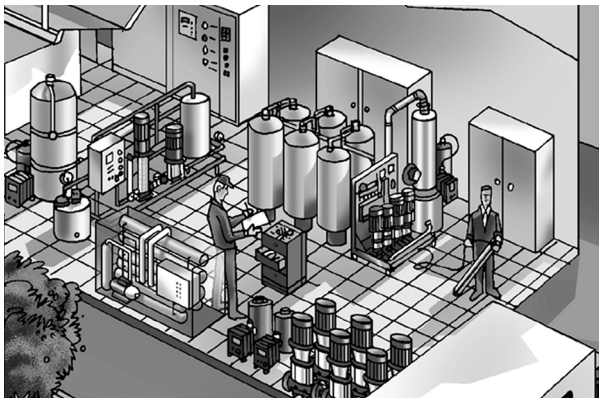

Fig. 2 Process water treatment

CRNE 1 and 3 HS

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Fig. 3 CRNE 3-HS pump

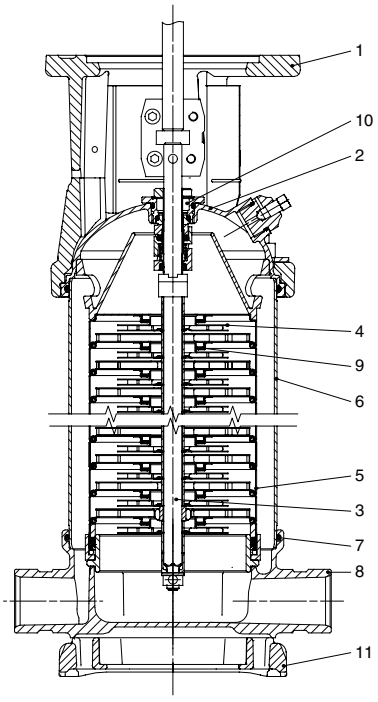

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Fig. 4 Sectional drawing of CRNE 1 and 3-HS

Pump

CRNE-HS is a single pump solution capable of generating up to 692 psi.

The CRNE-HS pump is a non self-priming, vertical multistage centrifugal pump fitted with a high speed Grundfos motor with integrated frequency converter, type MLE.

The direction of rotation is the opposite of that of standard pumps, and the chamber stack is turned upside-down, resulting in the pumped liquid flowing in the opposite direction.

This design ensures that the shaft seal is not affected by the pump discharge pressure.

The base, the pump head cover as well as vital pump components are made from stainless steel. The base has in-line suction and discharge ports.

The pump has a maintenance-free mechanical cartridge shaft seal.

Operating conditions

Liquid temperature:	–4 °F to +248 °F.
Maximum ambient temperature:	+104 °F.
Minimum inlet pressure:	29 psi.
Maximum inlet pressure:	218/362 psi. (static/operation).
Maximum operating pressure:	725 psi.

Materials

Pos.	Description	Materials	AISI/ASTM
1	Pump head	Cast iron EN-GJL-200	ASTM 25 B
2	Pump head cover	Stainless steel	CF8M [1]
3	Shaft	Stainless steel	AISI 316 AISI 329
4	Impeller	Stainless steel	AISI 316
5	Chamber	Stainless steel	AISI 316
6	Outer sleeve	Stainless steel	AISI 316
7	O-ring for outer sleeve	EPDM or FKM	
8	Base	Stainless steel	CF8M [1]
9	Neck ring	PTFE	
10	Shaft seal	Cartridge type	
11	Base plate	Cast iron EN-GJL-200 [2]	ASTM 25B
	Other rubber parts	EPDM, FKM, FXM and FFKM	

[1] CF8M is cast equivalent of AISI 316 stainless steel.

[2] Stainless steel is available on request.

CRN 5, 10, 15, 20 SF

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Fig. 5 CRN 15 SF

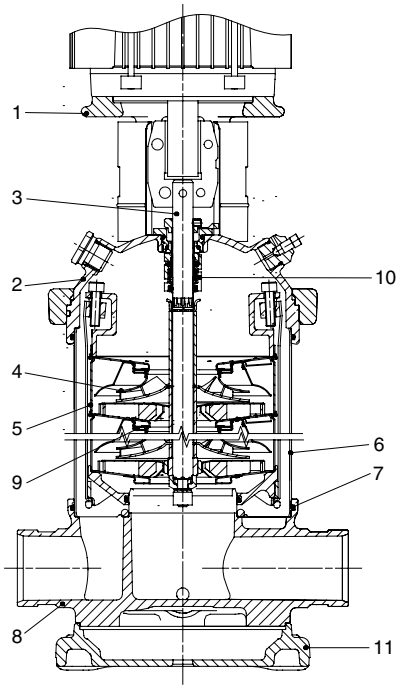

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Fig. 6 Sectional drawing of CRN 5, 10, 15, 20 SF

Pump

CRN-SF is a double pump system capable of generating up to 696 psi.

The system consists of two pumps in series. The first pump is a standard pump for feeding. The second pump is a high pressure pump especially designed for high pressures. This data booklet covers technical information about the high pressure pump.

The CRN-SF pump is a non self-priming, vertical multistage centrifugal pump fitted with a Grundfos specified TEFC-motor.

The pump consists of a base and a pump head. The pump body and the outer sleeve are secured between the base and the pump head by means of staybolts.

The direction of rotation is the opposite of that of standard pumps, and the chamber stack is turned upside-down, resulting in the pumped liquid flowing in the opposite direction.

The base, the pump head cover as well as vital pump components are made from stainless steel. The base has in-line suction and discharge ports.

The pump has a maintenance-free mechanical cartridge shaft seal.

Operating conditions

Liquid temperature:	–4 °F to +248 °F.
Maximum ambient temperature:	+104 °F.
Minimum inlet pressure:	29 psi.
Maximum inlet pressure:	
CRN 5SF	218/362 psi.
CRN 10, 15, 20	145/362 psi (static/operation).
Maximum operating pressure:	725 psi.

Materials

Pos.	Description	Materials	AISI/ASTM
1	Pump head	Cast iron	
2	Pump head cover	Stainless steel	CF8M [1]
3	Shaft	Stainless steel	AISI 329
4	Impeller	Stainless steel	AISI 316
5	Chamber	Stainless steel	AISI 316
6	Outer sleeve	Stainless steel	AISI 316
7	O-ring for outer sleeve	EPDM, FKM, FXM and FFKM	
8	Base	Stainless steel	CF8M [1]
9	Neckring	PTFE	
10	Shaft seal	Cartridge type	
11	Base plate	Cast iron EN-GJL-200 [2]	ASTM 25 B
	Other rubber parts in pump	EPDM, FKM, FXM and FFKM	

[1] CF8M is cast equivalent of AISI 316 stainless steel.

[2] Stainless steel is available on request.

CRN 32, 45, 64, 90 SF

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Fig. 7 CRN 45 and CRN 45 SF pump system

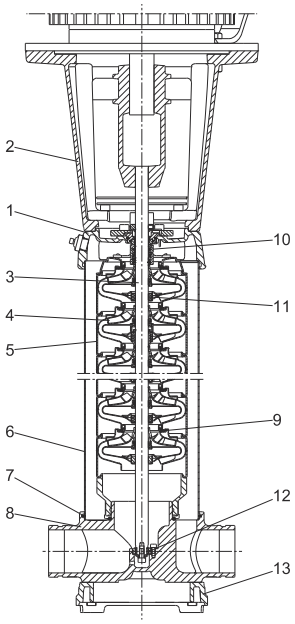

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Fig. 8 Sectional drawing of CRN 32, 45, 64, 90 SF

Pump

CRN-SF is a double pump system capable of generating up to 696 psi.

The system consists of two pumps in series. The first pump is a standard pump for feeding. The second pump is a high pressure pump especially designed for high pressures. This data booklet covers technical information about the high pressure pump.

The CRN-SF pump is a non self-priming, vertical multistage centrifugal pump fitted with a Grundfos specified TEFC-motor.

The pump consists of a base and a pump head. The pump body and the outer sleeve are secured between the base and the pump head by means of staybolts.

The direction of rotation is the opposite of that of standard pumps, and the chamber stack is turned upside-down, resulting the pumped liquid flowing in the opposite direction.

The base, the pump head cover as well as vital pump components are made from stainless steel. The base has in-line suction and discharge ports.

The pump has a maintenance-free mechanical cartridge shaft seal.

Operating conditions

Liquid temperature:	-22 °F to 248 °F
Minimum inlet pressure:	29 psi
Maximum inlet pressure:	145/362 psi (static/operation)
Maximum operating pressure:	725 psi

Materials

Pos.	Designation	Material	AISI/ASTM
1	Pump head	Cast Iron	
2	Pump head cover	Stainless steel	CF8M (equal to AISI 316)
3	Shaft	Stainless steel	AISI 329
4	Impeller	Stainless steel	AISI 316
5	Chamber	Stainless steel	AISI 316
6	Sleeve	Stainless steel	AISI 316
7	O-ring for sleeve	EPDM FKM, FFKM FXM	
8	Base	Stainless steel	CF8M (equal to AISI 316)
9	Neck ring	PTFE	
10	Shaft seal	HQQE, HQQV, HQQF, HQQK	
11	Base plate	Cast Iron EN-GJL-200 [1)]	ASTM 25B
	Other rubber parts	EPDM FKM, FFKM, FXM	

[1)] Stainless steel available on request.

2 x CR 32, 45, 64 and 90
2 x CRN 32, 45, 64 and 90

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Fig. 9 2 x CR, CRN double pump system

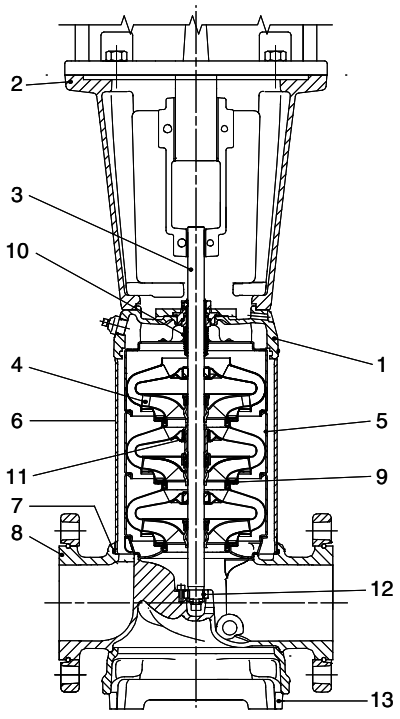

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Fig. 10 Sectional drawing of a CR(N) 45, 64, 90 pump

Pump

2 x CR, CRN is a double pump system capable of generating up to 557 psi. The system consists of two pumps in series. The first pump is a standard pump for feeding. The second pump is a high pressure pump and can be a specially designed pump for high pressures. This product guide covers technical information about the high pressure pump.

The CR, CRN high pressure pump is a non-self-priming, vertical multistage centrifugal pump fitted with a Grundfos specified motor and a specially developed high-pressure shaft seal. When necessary it includes a special pump sleeve and a bearing flange which make the pump capable of handling higher pressures.

CRN

The base, the pump head cover and all components in contact with the pumped liquid are made of stainless steel.

CR

The base and the pump head are made of ductile cast iron.

Operating conditions

Liquid temperature:	–22 °F to +248 °F.
Maximum ambient temperature:	+104 °F.
Maximum inlet pressure:	218/362 psi.
(with bearing flange if necessary)	(static/operation)
Maximum operating pressure:	580 psi.

Materials

Pos.	Description	Materials	AISI/ASTM
1	Pump head	CR: Ductile iron EN-GJS-500-7	ASTM 80-55-06
		CRN: Stainless steel	CF8M [1]
2	Motor stool	Cast iron EN-GJL-200	ASTM 25B
3	Shaft	Stainless steel	AISI 431 [3] SAF 2205 [4]
4	Impeller	Stainless steel	AISI 316
5	Chamber	Stainless steel	AISI 316
6	Outer sleeve	Stainless steel	AISI 316
7	O-ring for outer sleeve	EPDM or FKM	
8	Base	CR: Ductile iron EN-GJS-500-7	ASTM 80-55-06
		CRN: Stainless steel	CF8M [1]
9	Neck ring	Carbon-graphite filled PTFE	
10	Shaft seal	Cartridge type	
11	Bearing ring	Bronze/carbon- graphite filled PTFE	
12	Bottom bearing ring	TC/TC	
13	Base plate	Ductile iron [2] EN-GJS-500-7	ASTM 80-55-06
	Rubber parts	EPDM or FKM	

[1] CF8M is cast equivalent of AISI 316 stainless steel.
[2] Stainless steel is available on request.
[3] CR 45, 64, 90.
[4] CRN 45, 64, 90.

2 x CR 120 and 150
2 x CRN 120 and 150

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Fig. 11 2 x CR, CRN double pump system

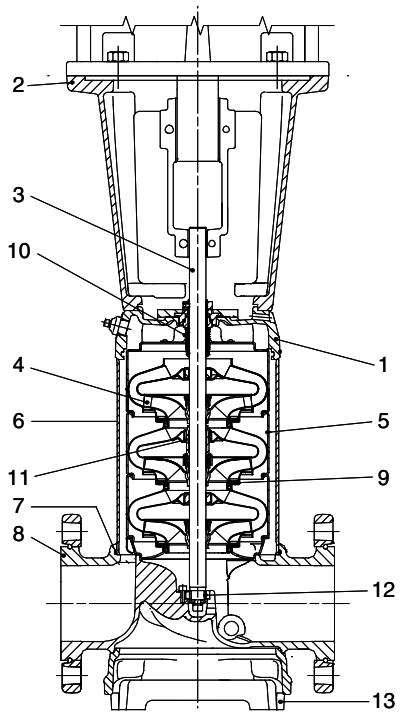

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Fig. 12 Sectional drawing of a CR(N) 120, 150 pump

Pump

2 x CR, CRN is a double pump system capable of generating up to 550 psi.

The system consists of two pumps in series. The first pump is a standard pump for feeding. The second pump is a high pressure pump.

The CR, CRN high pressure pump is a non-self-priming, vertical multistage centrifugal pump fitted with a Grundfos standard motor.

CRN

The base, the pump head cover and all components in contact with the pumped liquid are made of stainless steel.

CR

The base and the pump head are made of cast iron.

Operating conditions

Liquid temperature, HBQE:	0 °F to +248 °F.
Liquid temperature, HQQE:	-22 °F to +248 °F.
Maximum ambient temperature:	+104 °F.
Maximum inlet pressure:	290 psi.
Maximum operating pressure:	580 psi.

Materials

Pos.	Description	Materials	AISI/ASTM
1	Pump head	CR: Ductile iron EN-GJS-500-7	A 536 65-45-12
		CRN: Stainless steel	CF 8M
2	Motor stool 15 hp - 60 hp	Cast iron EN-GJL-200	A48-30 B
	Motor stool 75 hp - 100 hp	cast iron EN-GJS-500-7	A 536 65-45-12
3	Shaft	Stainless steel	CR: AISI 431 CRN: SAF 2205
4	Impeller	Stainless steel	CR: AISI 304 CRN: AISI 316
5	Chamber		
6	Outer sleeve	Stainless steel	AISI 316
7	O-ring for outer sleeve	EPDM, FKM, FFKM and FXM	
8	Base	CR: Cast iron EN-GJS-500-7	A 536 65-45-12
		CRN: Stainless steel	CF 8M
9	Base plate	Cast iron EN-GJS-500-7 [1)]	A536 65-45-12
10	Neck ring	PTFE	
11	Shaft seal [2)]	SiC/SiC (∅ 22) Carbon/SiC (∅ 32)	
12	Support bearing	PTFE	
13	Bearing ring	SiC/SiC	
14	Base plate, CRN only	Cast iron EN-GJS-500-7 [1)]	A536 65-45-12
	Other rubber parts	EPDM, FKM, FFKM, and FXM	

[1)] Stainless steel is available on request.

[3)] ∅ 22mm shaft 15 hp - 60 hp. ∅ 32mm shaft 75 hp - 100 hp

Type key

CR, CRN(E)

Example	CR	E	32	(s)	-4	-2	-A	-F	-G	-E	-H	QQ	E
Type range: CR, CRN													
Pump with integrated frequency control													
Flow rate [m^3/h]													
All impellers with reduced diameter (applies only to CR, CRN 1s)													
Number of impellers													
Number of reduced diameter impellers (CR(E), CRN(E) 32, 45, 64, 90)													
Code for pump version													
Code for pipe connection													
Code for materials													
Code for rubber parts													
Code for shaft seal													

Codes

Example	A	-F	-A	-E	-H	QQ	E
Pump version							
A Basic version [1]							
B Oversize motor							
E Certificate/approval							
F CR pump for high temperatures (air-cooled top assembly)							
H Horizontal version							
HS High-pressure pump with high speed MLE motor							
I Different pressure rating							
J Pump with different max speed							
K Pump with low NPSH							
M Magnetic drive							
N Fitted with sensor							
P Undersize motor							
R Horizontal version with bearing bracket							
SF High pressure pump							
T Over size motor (two flange sizes bigger)							
U NEMA version [1]							
X Special version							
Pipe connection							
A Oval flange							
B NPT thread							
CA FlexiClamp (CRI(E), CRN(E) 1, 3, 5, 10, 15, 20)							
CX Triclamp (CRI(E), CRN(E) 1, 3, 5, 10, 15, 20)							
F DIN flange							
G ANSI flange							
J JIS flange							

Example	A	-F	-A	-E	-H	QQ	E
N Changed diameter of ports							
P Victaulic (PJE) coupling							
X Special version							
Materials							
A Basic version							
D Carbon-graphite filled PTFE (bearings)							
G Wetted parts AISI 316							
GI All parts stainless steel, wetted parts AISI 316							
I Wetted parts AISI 304							
II All parts stainless steel, wetted parts AISI 304							
K Bronze (bearings)							
S SiC bearings + PTFE neck rings							
X Special version							
Code for rubber parts							
E EPDM							
F FXM							
K FFKM							
V FKM							
Shaft seal							
A O-ring seal with fixed driver							
B Rubber bellows seal							
E Cartridge seal with O-ring							
H Balanced cartridge seal with O-ring							
K Metal bellows cartridge seal							
O Double seal, back-to-back							
P Double seal, tandem							
X Special version							
B Carbon, synthetic resin-impregnated							
H Cemented tungsten carbide, embedded (hybrid)							
Q Silicon carbide							
U Cemented tungsten carbide							
X Other ceramics							
E EPDM							
F FXM							
K FFKM							
V FKM							

[1] In August 2003 the NEMA version pump code was discontinued for all material numbers created by Grundfos manufacturing companies in North America. The NEMA version pump code will still remain in effect for existing material numbers. NEMA version pumps built in North America after this change will have either an A or U as the pump version code depending on the date the material number was created.

Operating range of the shaft seal for the high pressure pump

The actual operating range of the shaft seal for the high pressure pump depends on operating pressure, type of shaft seal and liquid temperature. The following temperature ranges apply to clean water.

Operating conditions of the shaft seal for the CR high pressure pump

Shaft seal	Description	Max. temp. range [°F]
HQQE	O-ring (cartridge) (balanced seal), SiC/SiC, EPDM	–22 to +248
HQQV	O-ring (cartridge) (balanced seal), SiC/SiC, FKM	–4 to +194
HUBE	O-ring (cartridge) (balanced seal), TC/carbon, EPDM	+32 to +248
HUBV	O-ring (cartridge) (balanced seal), TC/carbon, FKM	+32 to +194

Pumped liquids

Thin, non-explosive liquids, not containing solid particles or fibers. The liquid must not chemically attack the pump materials.

When pumping liquids with a density and/or viscosity higher than that of water, oversized motors must be used, if required.

Whether a pump is suitable for a particular liquid depends on a number of factors of which the most important are the chloride content, pH value, temperature and content of chemicals, oils, etc.

Please note that aggressive liquids (e.g. sea water and some acids) may attack or dissolve the protective oxide film of the stainless steel and thus cause corrosion.

Performance curves

The guidelines below apply to the curves shown on the following pages:

1. The motors used for the measurements are standard TEFC or MLE motors.
2. Measurements have been made with airless water at a temperature of 68 °F.
3. The curves apply to a kinematic viscosity of υ = 1 cSt (1 mm^2/s).
4. Due to the risk of overheating, the pumps should **not** be used at a flow below the minimum flow rate.

The curve below shows the minimum flow rate as a percentage of the nominal flow rate in relation to the liquid temperature.

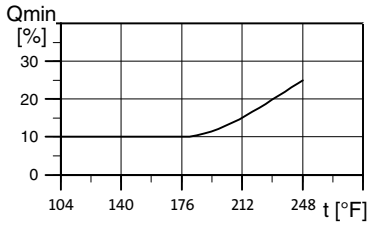

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Fig. 13 Minimum flow rate

2. Selection and sizing

Selection of CR, CRN high pressure pumps

Pump size

Selection of pump size should be based on:

- Required flow and pressure at the point of use.
- Pressure loss as a result of height differences.
- Friction loss in the pipework.
  It may be necessary to account for pressure loss in connection with long pipes, bends or valves, etc.
- Best efficiency at the estimated duty point.

Efficiency

If the pump is expected always to operate at the same duty point, select a pump which is operating at a duty point corresponding with the best efficiency of the pump.

In case of varying consumption, select a pump which best efficiency falls within the duty range representing the highest power consumption, i.e. typically the duty range covering the greater part of the duty time.

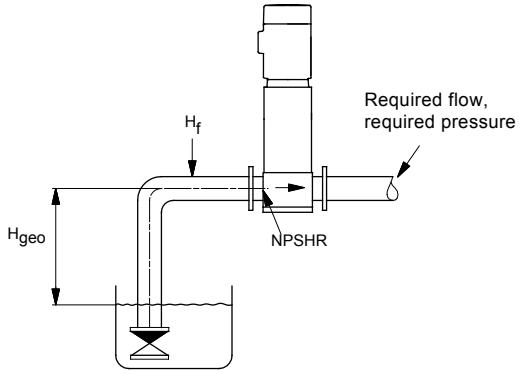

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Fig. 14 Dimensional data

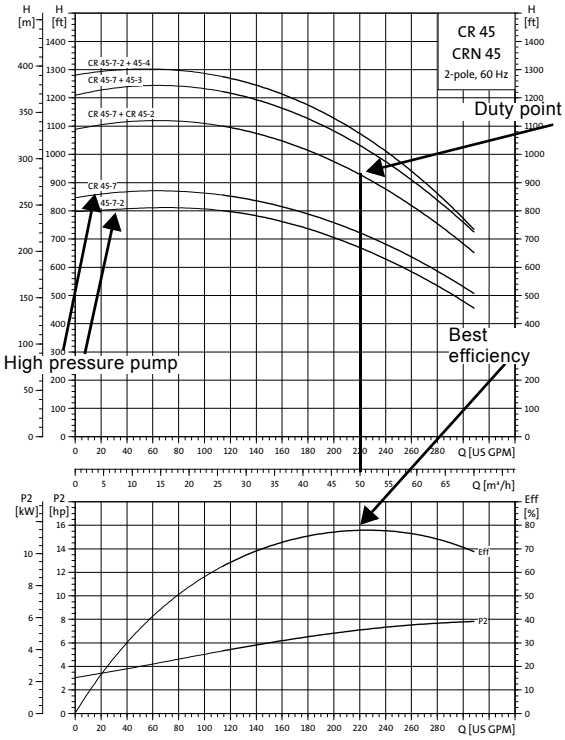

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Fig. 15 Example of a duty point

Shaft seal

As standard, the CR, CRN high pressure range is fitted with a high pressure cartridge shaft seal suitable for the most common high pressure applications.

The following three key parameters must be taken into account, when selecting the shaft seal:

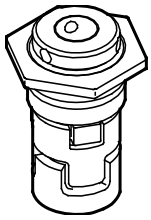
- type of pumped liquid and
- liquid temperature.

Grundfos offers a wide range of shaft seal variants to meet specific demands.

Inlet pressure and operating pressure

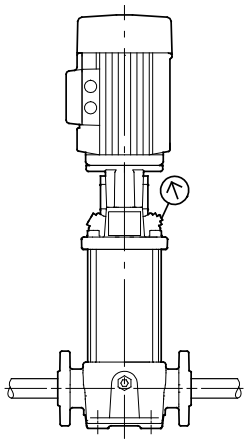
The limit values stated on pages 4-7 must not be exceeded as regards

- minimum inlet pressure
- maximum inlet pressure
- maximum operating pressure.



TM02 0538 4800

Fig. 16 Shaft seal (Cartridge type)



TM02 1204 0601

Fig. 17 Inlet and operating pressure

Examples of operating and inlet pressures.

The values for the operating and inlet pressures shown in the tables must not be considered individually but must always be compared, see the following examples:

Example 1:

The following pumps in series are selected.

First stage pump CRN 5-24
Second stage pump CRN 5-24SF

	CRN 5-24	CRN 5-24SF
Maximum operating pressure	362 psi	725 psi
Maximum inlet operating pressure	218 psi	362 psi

The pump discharge pressure against a closed valve for a CRN 5-24 is 338 psi.

The first stage pump is not allowed to operate at an inlet pressure of 218 psi. The maximum inlet pressure of the the first stage pump is 362 - 338 = **24 psi**.

Example 2:

The following pumps in series are selected.

First stage pump CRN32-3
Second stage pump CRN32-10

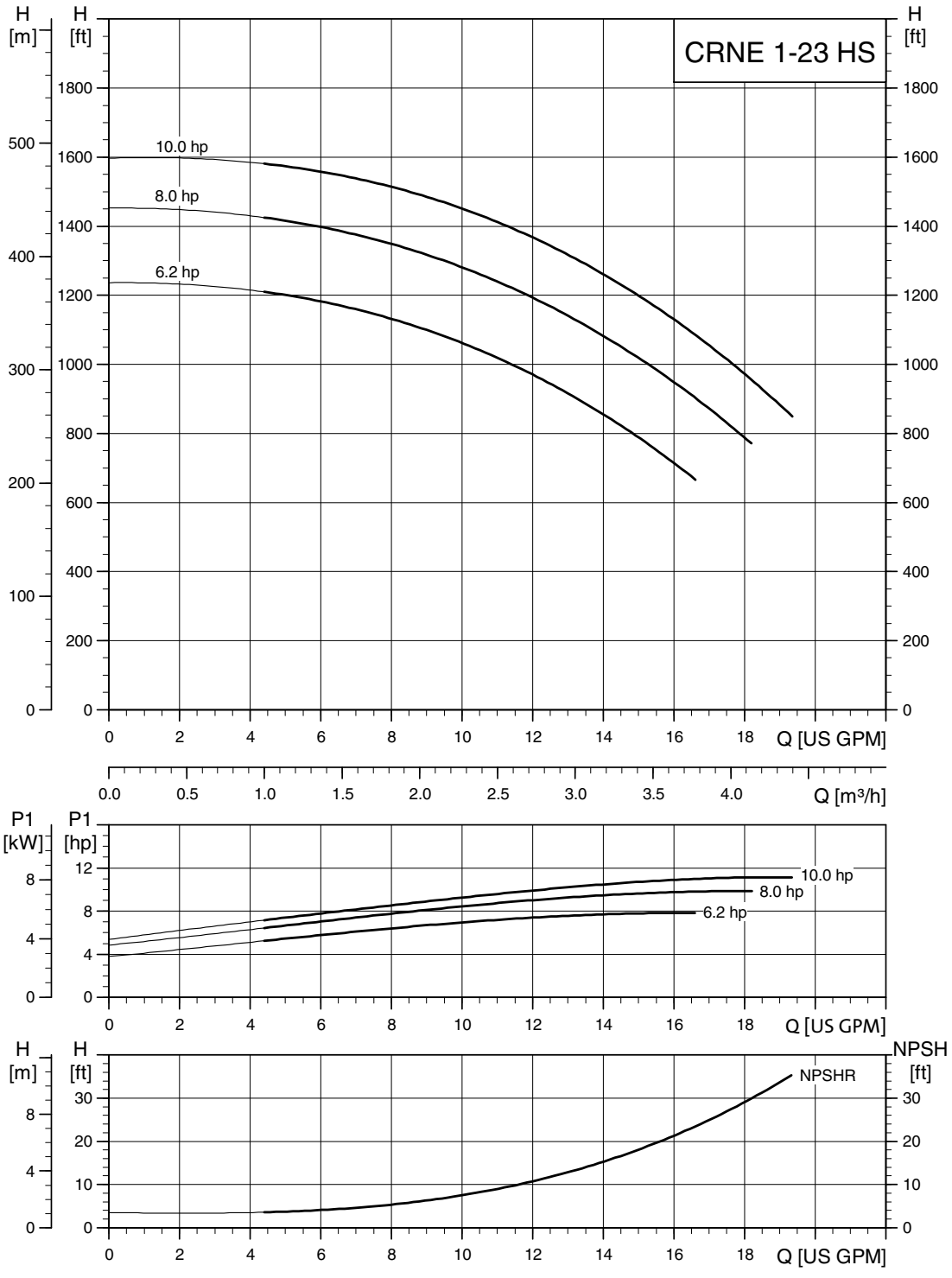
	CRN 32-3	CRN 32-10
Maximum operating pressure	232 psi	580 psi
Maximum inlet operating pressure	145 psi	218 psi

The pump discharge pressure against a closed valve for the two pumps in series is 519 psi.

The first stage pump is not allowed to operate at an inlet pressure of 145 psi. The maximum inlet pressure of the the first stage pump is 580 - 519 = **61 psi**.

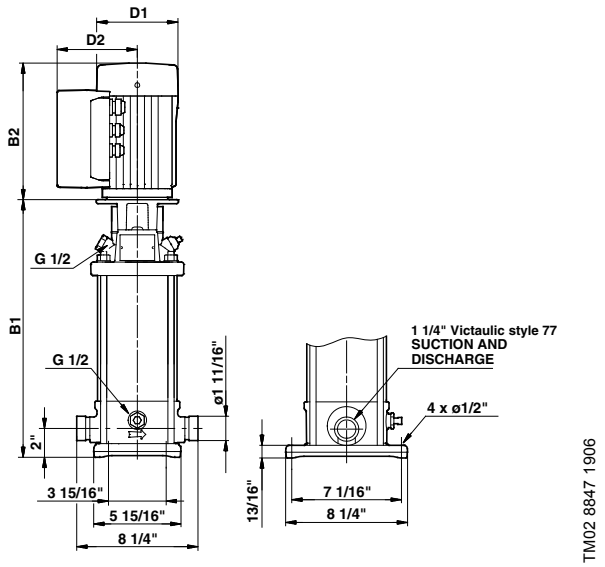
3. Performance curves/Technical data

CRNE 1-HS



TM02 8308 2806

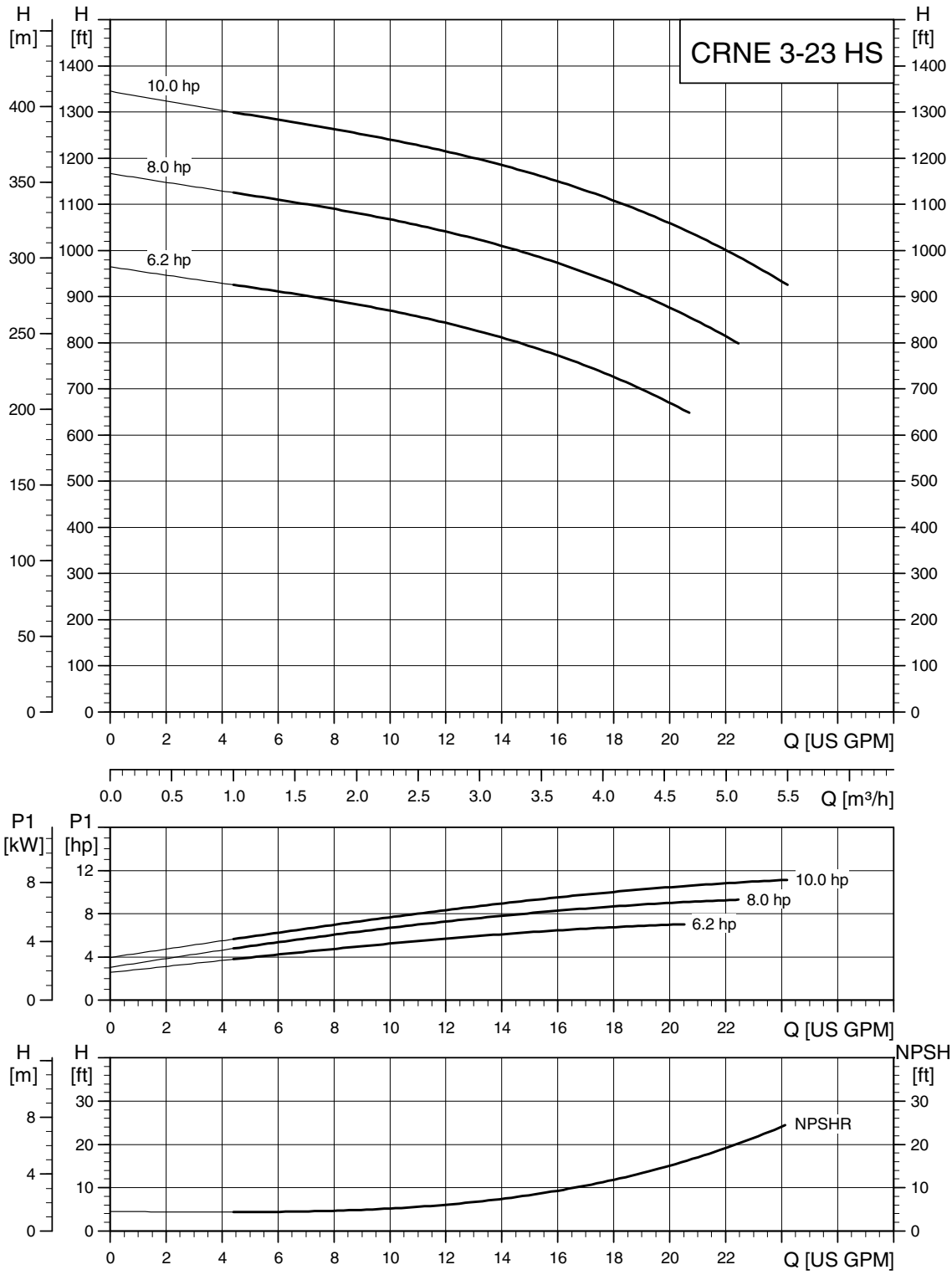
Dimensional sketch



Dimensions and weights

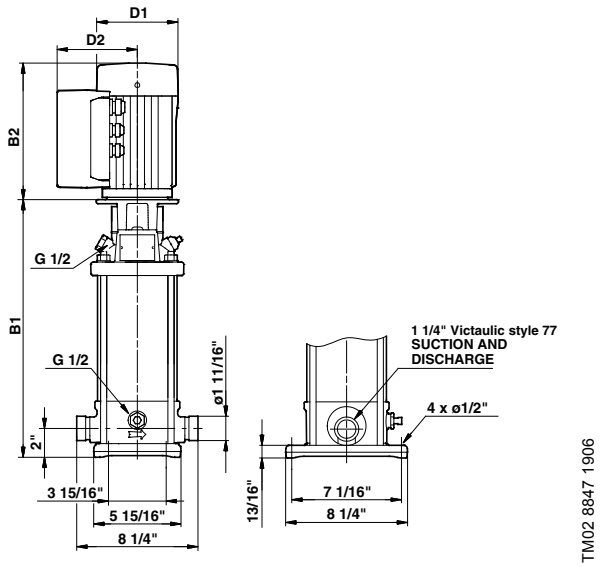
Pump type	Hp	Ph	Voltage [V]	Frame size	Dimensions [in]				PJE ship wt.[1] [lbs]
					PJE B1	TEFC D1	TEFC D2	PJE TEFC B1+B2	
CRNE 1-23 HS	6.2	3	460	112 CA	26.77	8.66	7.40	41.42	148
CRNE 1-23 HS	8.0	3	460	112 CB	26.77	8.66	7.40	42.16	157
CRNE 1-23 HS	10.0	3	460	112 DA	26.77	10.24	8.39	42.16	168

CRNE 3-HS



TM02 8309 2806

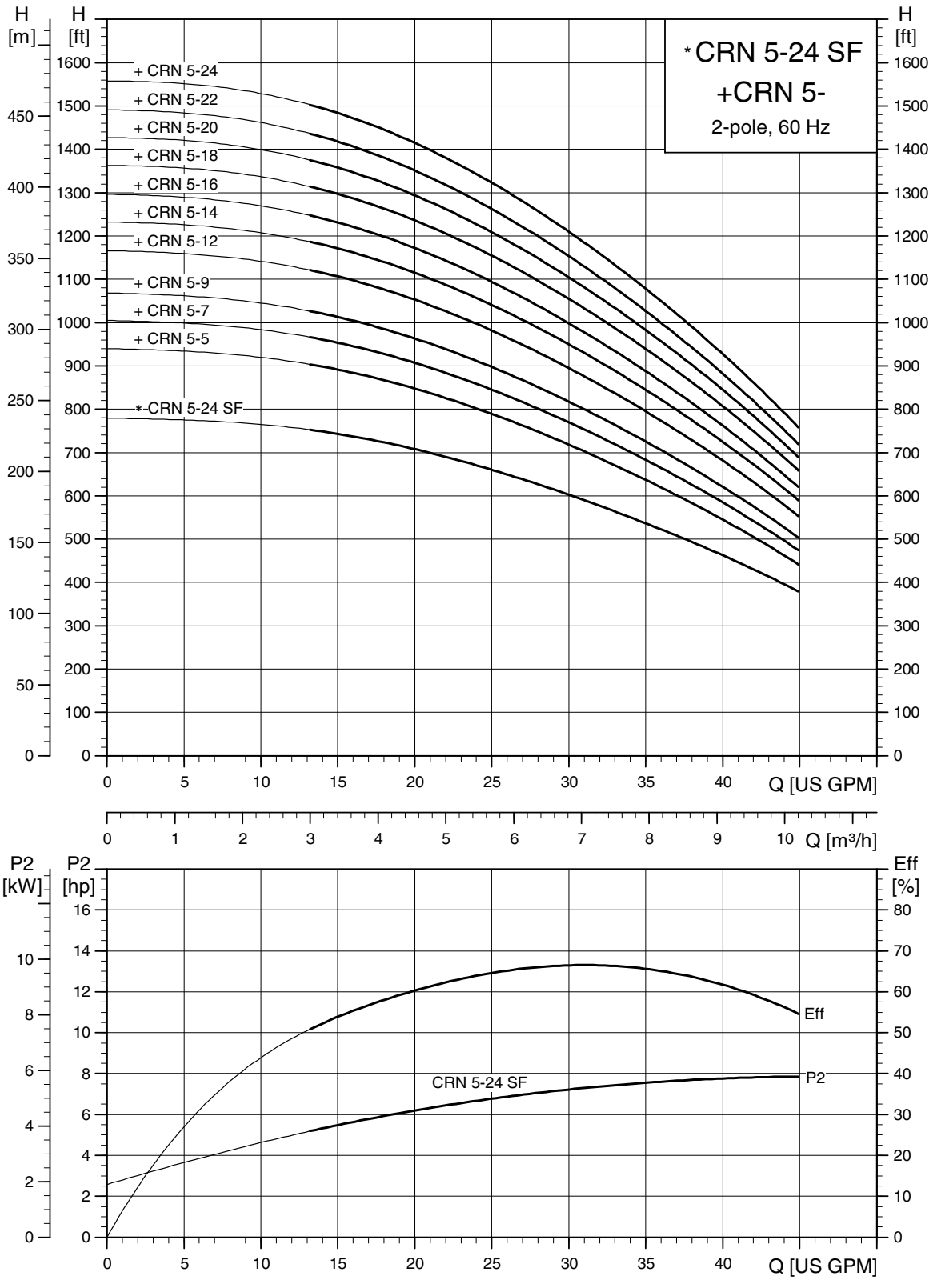
Dimensional sketch



Dimensions and weights

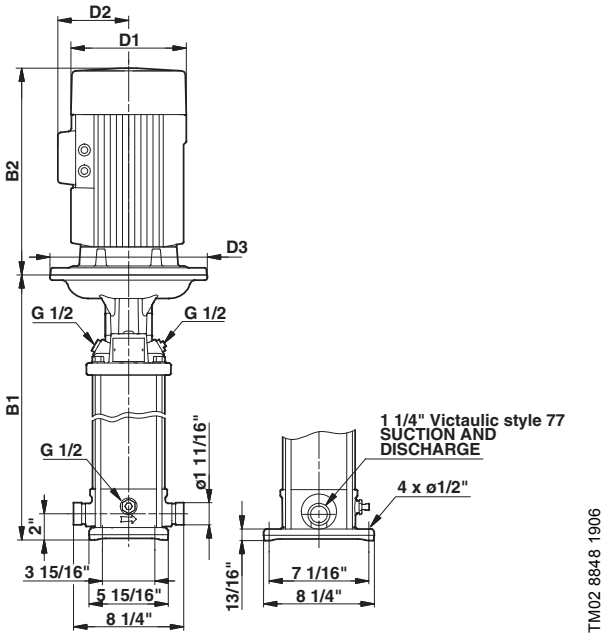
Pump type	Hp	Ph	Voltage [V]	Frame size	Dimensions [in]				PJE ship wt.[1] [lbs]
					PJE B1	TEFC D1	TEFC D2	PJE TEFC B1+B2	
CRNE 3-23 HS	6.2	3	460	112 CA	26.77	8.66	7.40	41.42	148
CRNE 3-23 HS	8.0	3	460	112 CB	26.77	8.66	7.40	42.16	157
CRNE 3-23 HS	10.0	3	460	112 DA	26.77	10.24	8.39	42.16	168

CRN 5-SF

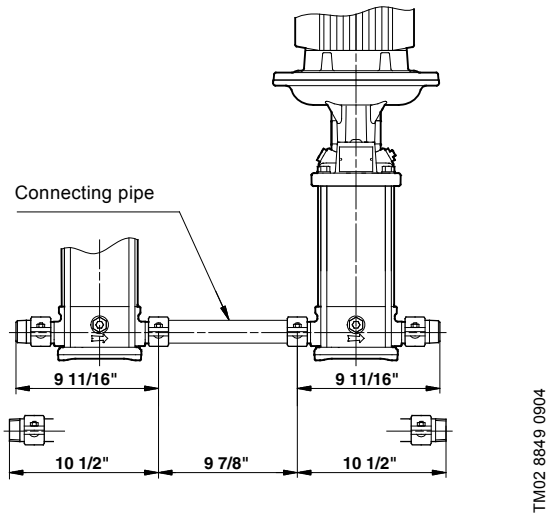


TM02 8310 2806

Dimensional sketches



CRN feed pump/CRN SF high-pressure pump

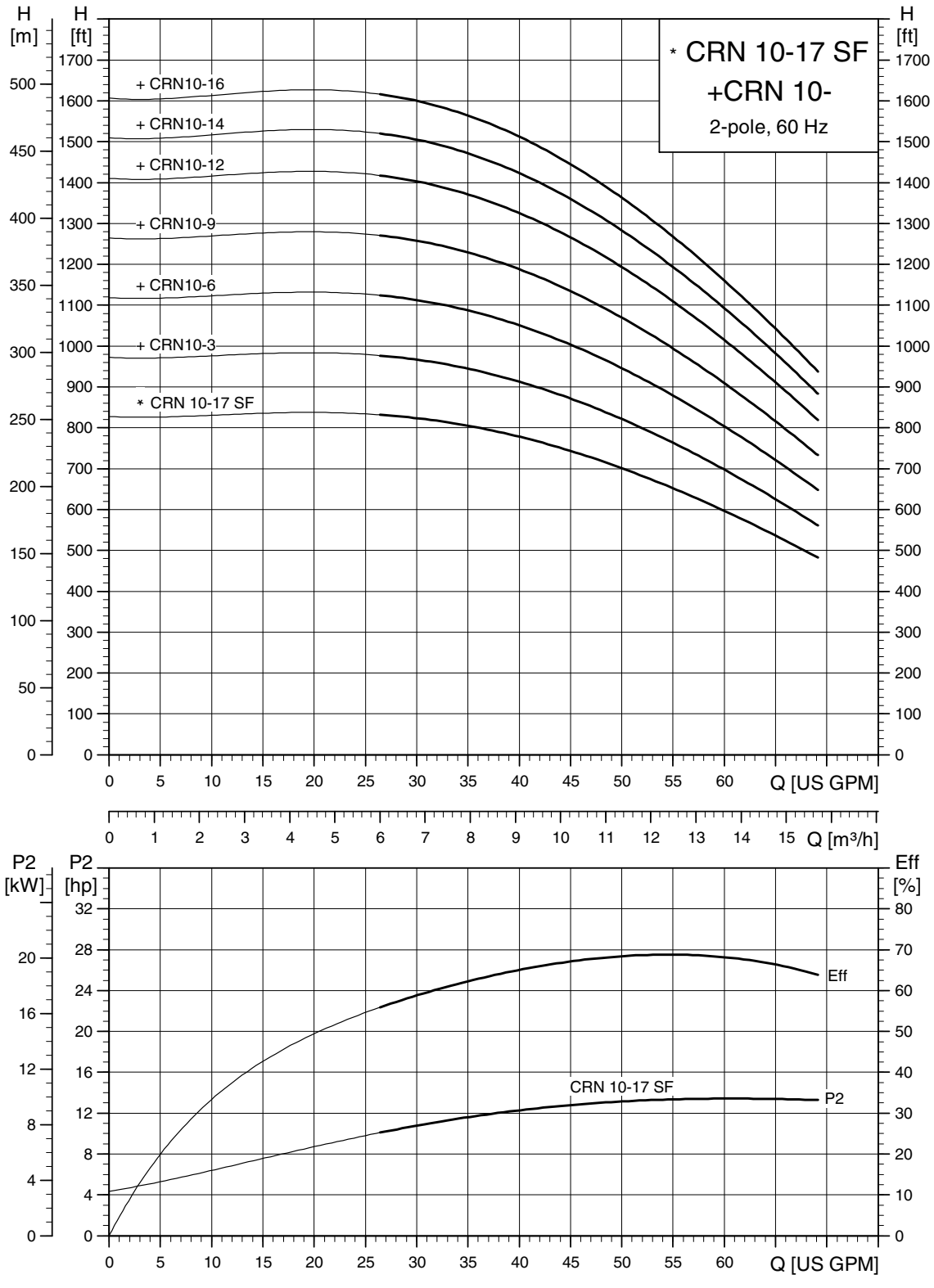


CRN feed pump, connecting pipe and CRN SF high-pressure pump

Dimensions and weights

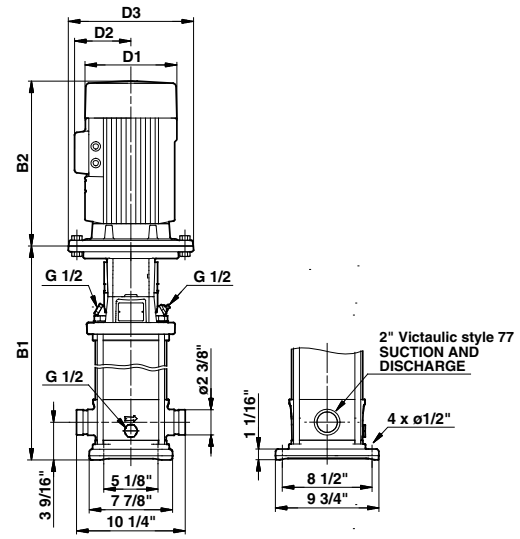
Pump type	Hp	Ph	Voltage [V]	Frame size	Dimensions				PJE ship wt.[1] [lbs]
					PJE B1	TEFC D1	TEFC D2	PJE TEFC B1+B2	
CRN 5-5	2	1	115/208-230	56C	15.28	7.19	5.73	27.84	92
		3	208-230/460	56C	15.28	7.01	4.33	26.50	79
CRN 5-7	3	1	115/208-230*	182TC	18.51	8.60	6.87	33.16	127
		3	208-230/460	182TC	18.51	7.01	4.33	31.74	98
CRN 5-9	3	1	115/208-230	182TC	20.63	8.60	6.87	35.28	130
		3	208-230/460	182TC	20.63	7.01	4.33	33.86	101
CRN 5-12	5	1	208-230**	182TC	23.82	10.62	7.46	39.34	161
		3	208-230/460	182TC	23.82	8.66	5.28	39.33	154
CRN 5-14	5	1	208-230**	182TC	25.94	10.62	7.46	41.46	163
		3	208-230/460	182TC	25.94	8.66	5.28	41.45	160
CRN 5-16	5	1	208-230**	182TC	28.07	10.62	7.46	43.59	166
		3	208-230/460	182TC	28.07	8.66	5.28	43.58	162
CRN 5-18	7 1/2	1	208-230	213TC	30.71	10.22	7.62	46.24	184
		3	208-230/460	213TC	30.71	8.66	5.28	46.22	171
CRN 5-20	7 1/2	1	208-230	213TC	32.83	10.22	7.62	48.36	187
		3	208-230/460	213TC	32.83	8.66	5.28	48.34	174
CRN 5-22	7 1/2	1	208-230	213TC	34.96	10.22	7.62	50.49	283
		3	208-230/460	213TC	34.96	8.66	5.28	50.47	270
CRN 5-24	7 1/2	1	208-230	213TC	37.09	10.22	7.62	52.62	286
		3	208-230/460	213TC	37.09	8.66	5.28	52.60	273
CRN 5-24SF	10	3	460	132SB	35.59	10.24	6.26	50.51	28.5

CRN 10-SF

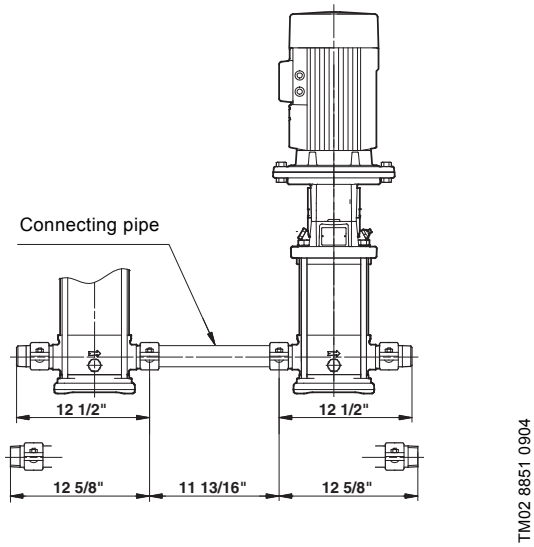


TM02 8311 2806

Dimensional sketches



CRN feed pump/CRN SF high-pressure pump

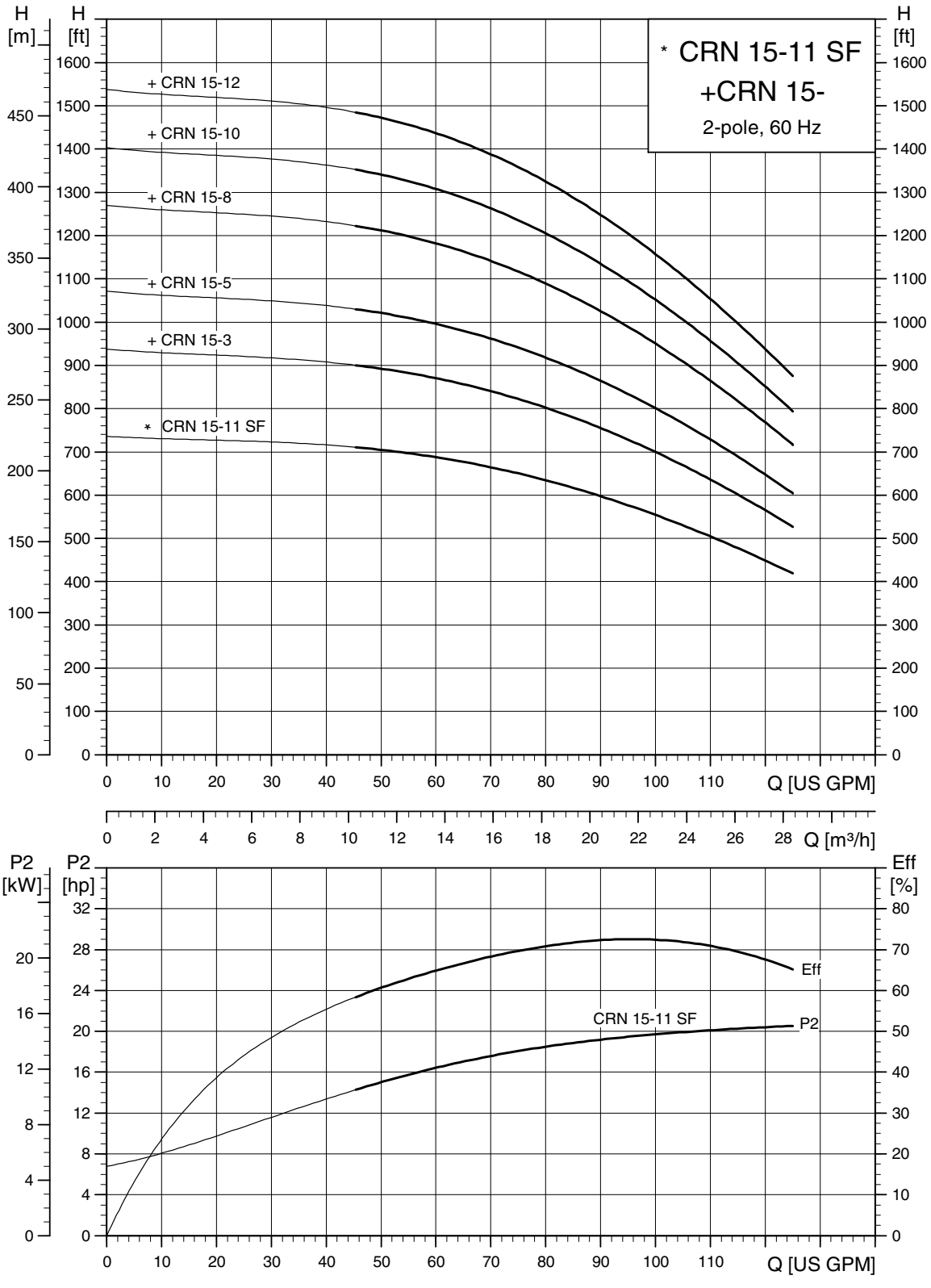


CRN feed pump, connecting pipe and CRN SF high-pressure pump

Dimensions and weights

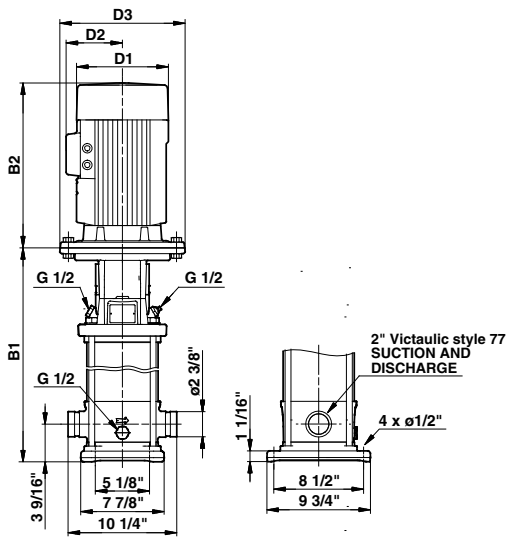
Pump type	Hp	Ph	Voltage [V]	Frame size	Dimensions							PJE ship wt.[1] [lbs]
					PJE B1	TEFC D1	TEFC D2	PJE TEFC B1+B2	ODP D1	ODP B2	PJE ODP B1+B2	
CRN 10-3	3	1	115/208-230	182TC	17.13	8.60	6.87	31.78	-	-	-	165
		3	208-230/460		17.13	7.01	4.33	30.36	-	-	-	136
CRN 10-6	5	1	208-230	182TC	20.67	10.62	7.46	36.19	-	-	-	194
		3	208-230/460		20.67	8.66	5.28	36.18	-	-	-	190
CRN 10-9	7 1/2	1	208-230	213TC	24.53	10.22	7.62	40.06	-	-	-	221
		3	208-230/460		24.53	8.66	5.28	40.04	-	-	-	207
CRN 10-12	10	1	230	213TC	28.07	10.23	10.30	44.14	-	-	-	335
		3	208-230/460		28.07	8.66	5.28	43.58	-	-	-	214
CRN 10-14	15	3	208-230/460	254TC	32.95	10.22	8.67	49.53	10.62	7.33	49 1/4	421
CRN 10-16	15	3	208-230/460	254TC	35.31	10.22	8.67	51.89	10.62	7.33	51 5/8	431
CRN 10-17 SF	15	3	460	160MB	38.07	12.36	8.03	56.61	-	-	-	451

CRN 15-SF

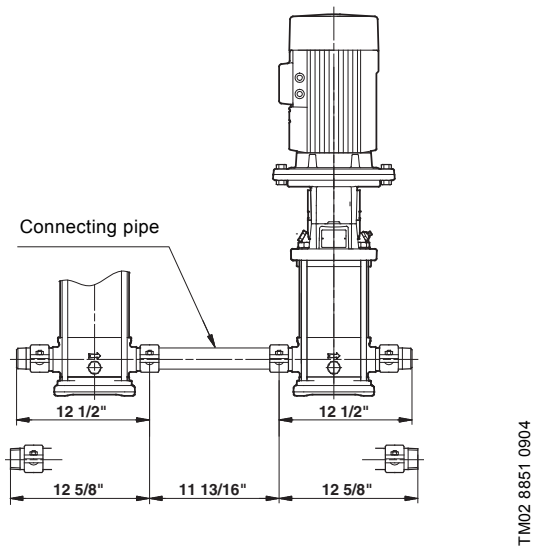


TM02 8312 2806

Dimensional sketches



CRN feed pump/CRN SF high-pressure pump

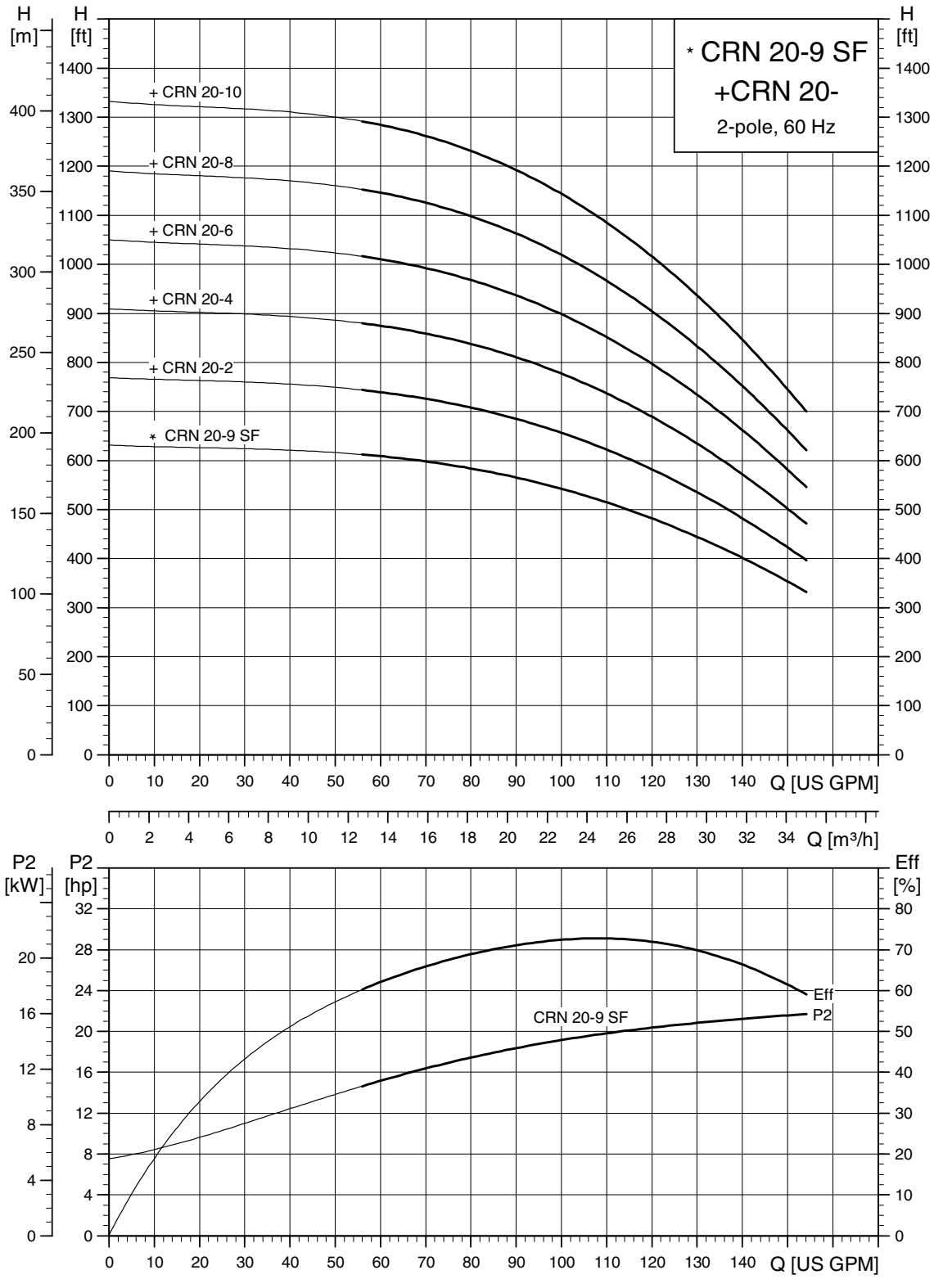


CRN feed pump, connecting pipe and CRN SF high-pressure pump

Dimensions and weights

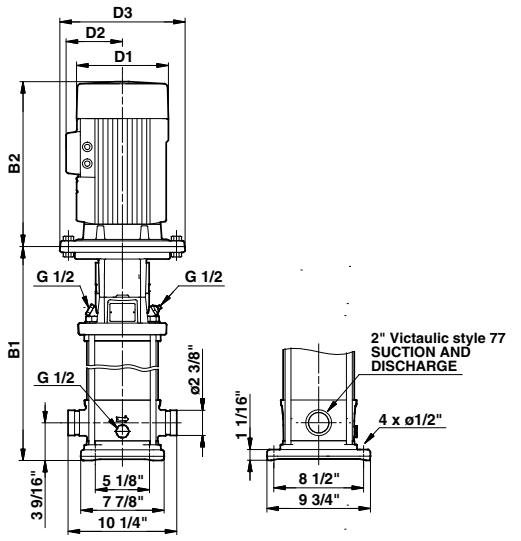
Pump type	Hp	Ph	Voltage [V]	Frame size	Dimensions							PJE ship wt.[1] [lbs]
					PJE B1	TEFC D1	TEFC D2	PJE TEFC B1+B2	ODP D1	ODP B2	PJE ODP B1+B2	
CRN 15-3	7 1/2	1	208-230	213TC	19.21	10.22	7.62	34.74	-	-	-	205
		3	208-230/460		19.21	8.66	5.28	34.72	-	-	-	194
CRN 15-5	10	1	230	213TC	22.76	10.23	10.30	38.83	-	-	-	324
		3	208-230/460		22.76	8.66	5.28	38.27	-	-	-	203
CRN 15-8	15	3	208-230/460	254TC	30.59	10.22	8.67	47.17	10.62	7.33	46.90	420
CRN 15-10	20	3	230/460	254TC	34.13	10.22	8.67	50.71	11.50	8.92	53.82	431
CRN 15-12	25	3	230/460	284TSC	37.05	12.94	11.52	56.87	11.50	8.94	57.86	485
CRN 15-11 SF	20	3	460	160MD	38.46	12.36	8.03	57.00	-	-	-	435

CRN 20-SF



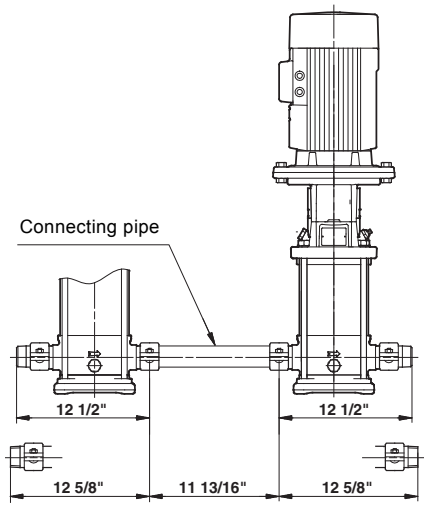
TM02 8313 2806

Dimensional sketches



TM02 8850 1906

CRN feed pump/CRN SF high-pressure pump



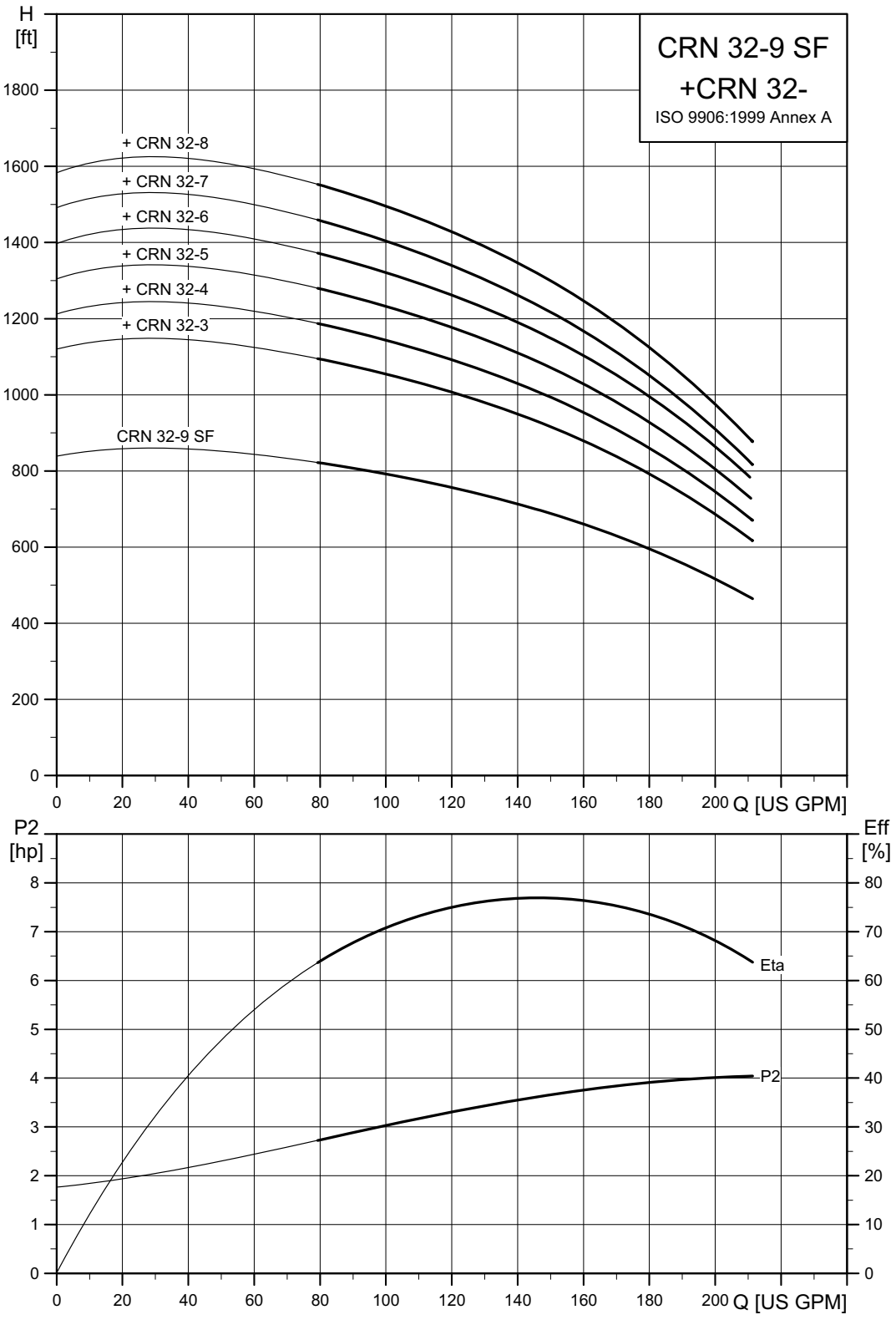
TM02 8851 0904

CRN feed pump, connecting pipe and CRN SF high-pressure pump

Dimensions and weights

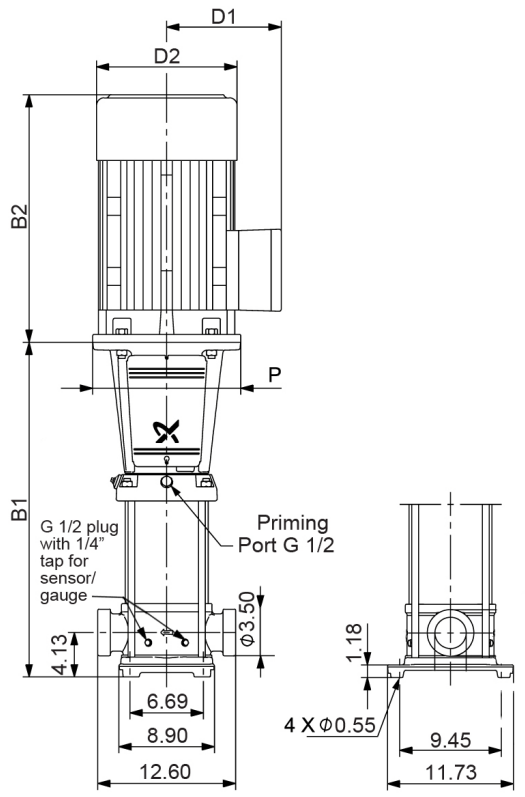
Pump type	Hp	Ph	Voltage [V]	Frame size	Dimensions							PJE ship wt.[1] [lbs]
					PJE B1	TEFC D1	TEFC D2	PJE TEFC B1+B2	ODP D1	ODP B2	PJE ODP B1+B2	
CRN 20-2	5	1	208-230	182TC	17.13	10.62	7.46	32.65	-	-	-	187
		3	208-230/460		17.13	8.66	5.28	32.64	-	-	-	184
CRN 20-4	10	1	230	213TC	20.98	10.23	10.30	37.05	-	-	-	320
		3	208-230/460		20.98	8.66	5.28	36.49	-	-	-	196
CRN 20-6	15	3	208-230/460	254TC	27.05	10.22	8.67	43.63	10.62	7.33	43.36	385
CRN 20-8	20	3	230/460	254TC	30.59	10.22	8.67	47.17	11.50	8.92	50.28	424
CRN 20-10	25	3	230/460	284TSC	33.5	12.94	11.52	53.32	11.50	8.94	54.31	479
CRN 20-9 SF	25	3	460	160LB	34.92	12.36	8.03	55.20	-	-	-	486

CRN 32 SF, 60 Hz



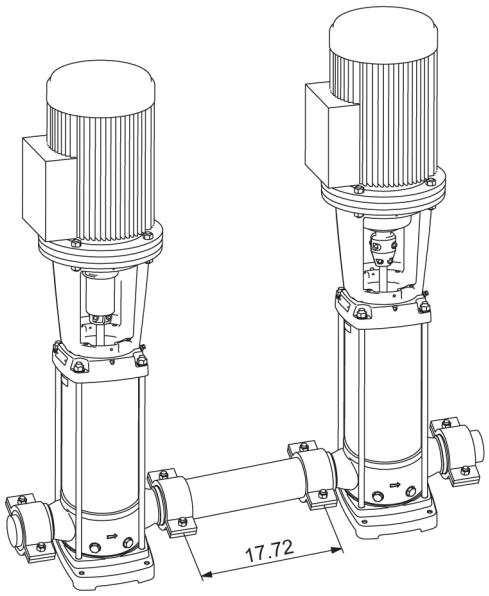
TM05 9549 1013

Dimensional sketches



CRN feed pump/CRN high-pressure pump

TM05 9426 0913



TM05 9427 0913

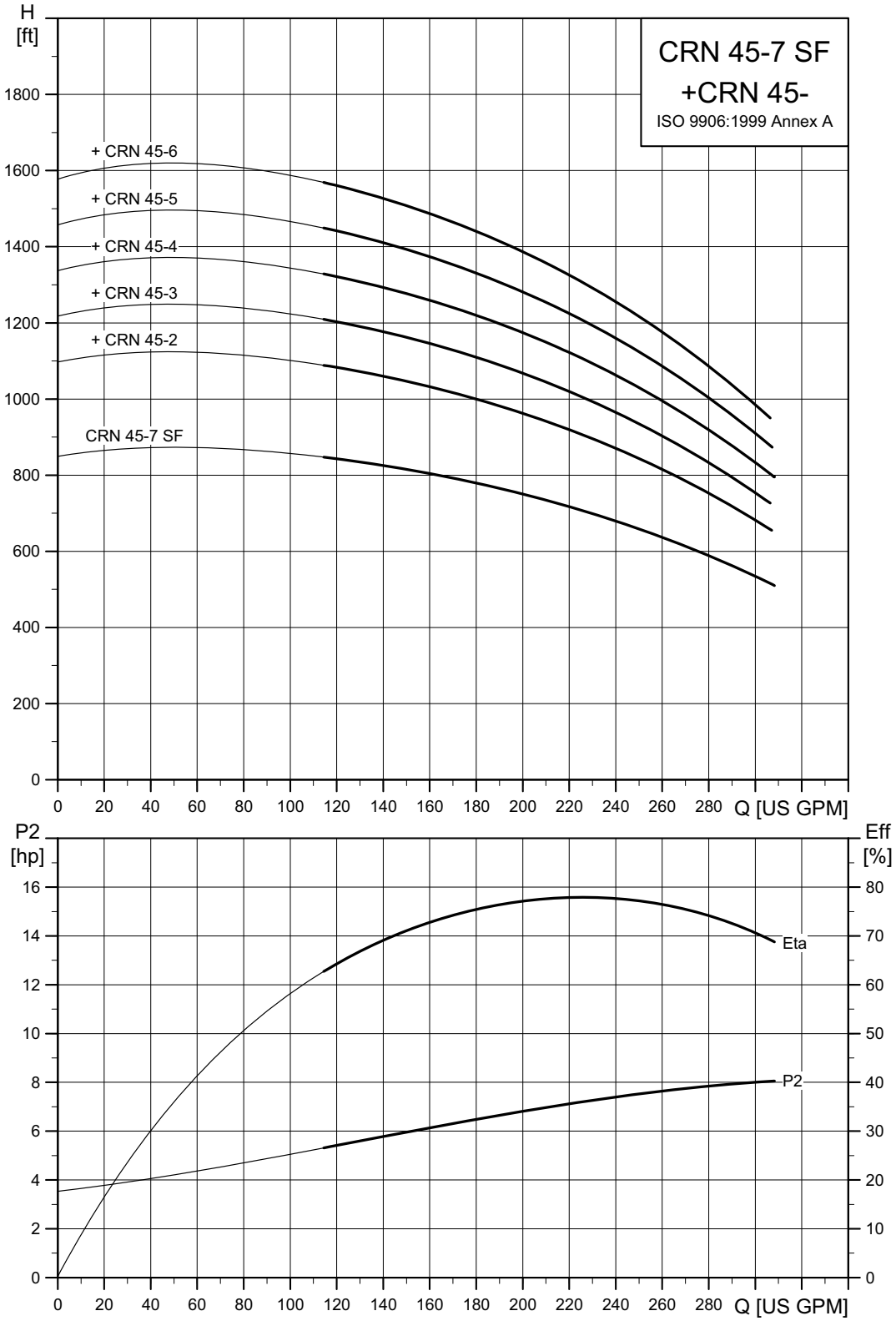
Dimensions and weights

Pump type	P2 (Hp)	Ph	ANSI Dimensions (inch)							Ship Wt. (lbs.)
			B1	TEFC			ODP			
				D1	D2	B1+B2	D1	D2	B1+B2	
CRN 32-3	15	3	29.72	10.22	8.67	46.30	10.62	7.33	46.03	366
CRN 32-4	20	3	32.48	10.22	8.67	49.06	11.50	8.92	52.17	377
CRN(E) 32-5	20	3	35.24	10.22	8.67	51.82	11.50	8.92	54.93	384
CRN(E) 32-6	25	3	37.99	12.94	11.52	57.81	11.50	8.94	58.80	438
CRN(E) 32-7	30	3	40.75	15.32	13.11	63.94	11.50	8.94	62.56	606
CRN 32-8	40	3	43.5	15.32	13.11	66.69	13.25	12.21	66.75	635
CRN 32-9	40	3	46.26	15.32	13.11	69.45	13.25	12.21	69.51	641
CRN 32-9 SF*	40	3	49.02	15.59	12.40	73.03	–	–	–	825

[1] Weights are based on pump with TEFC motor (see price list for individual weights)
All dimensions in inches unless otherwise noted.

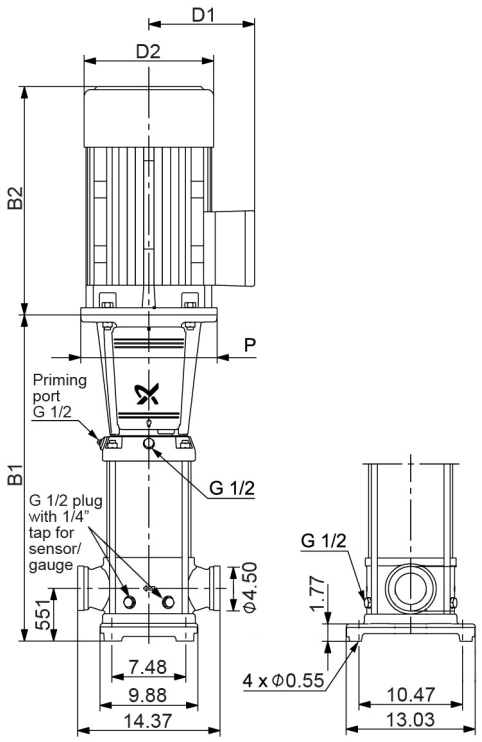
*High pressure pump

CRN 45 SF, 60 Hz



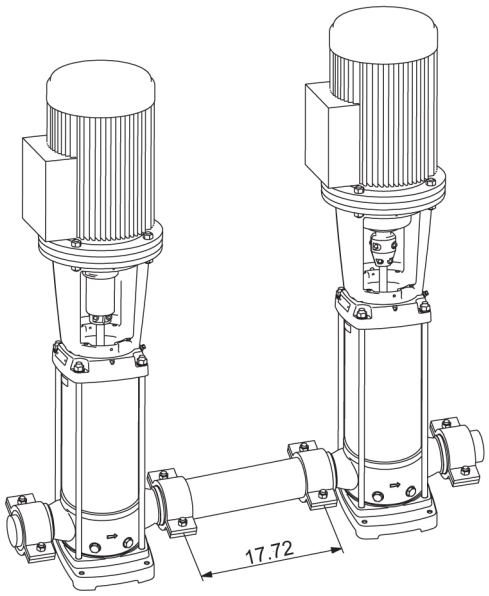
TM05 9550 1013

Dimensional sketches



CRN feed pump/CRN high-pressure pump

TM05 9461 0913



CRN feed pump, connecting pipe and CRN high-pressure pump

TM05 9462 0913

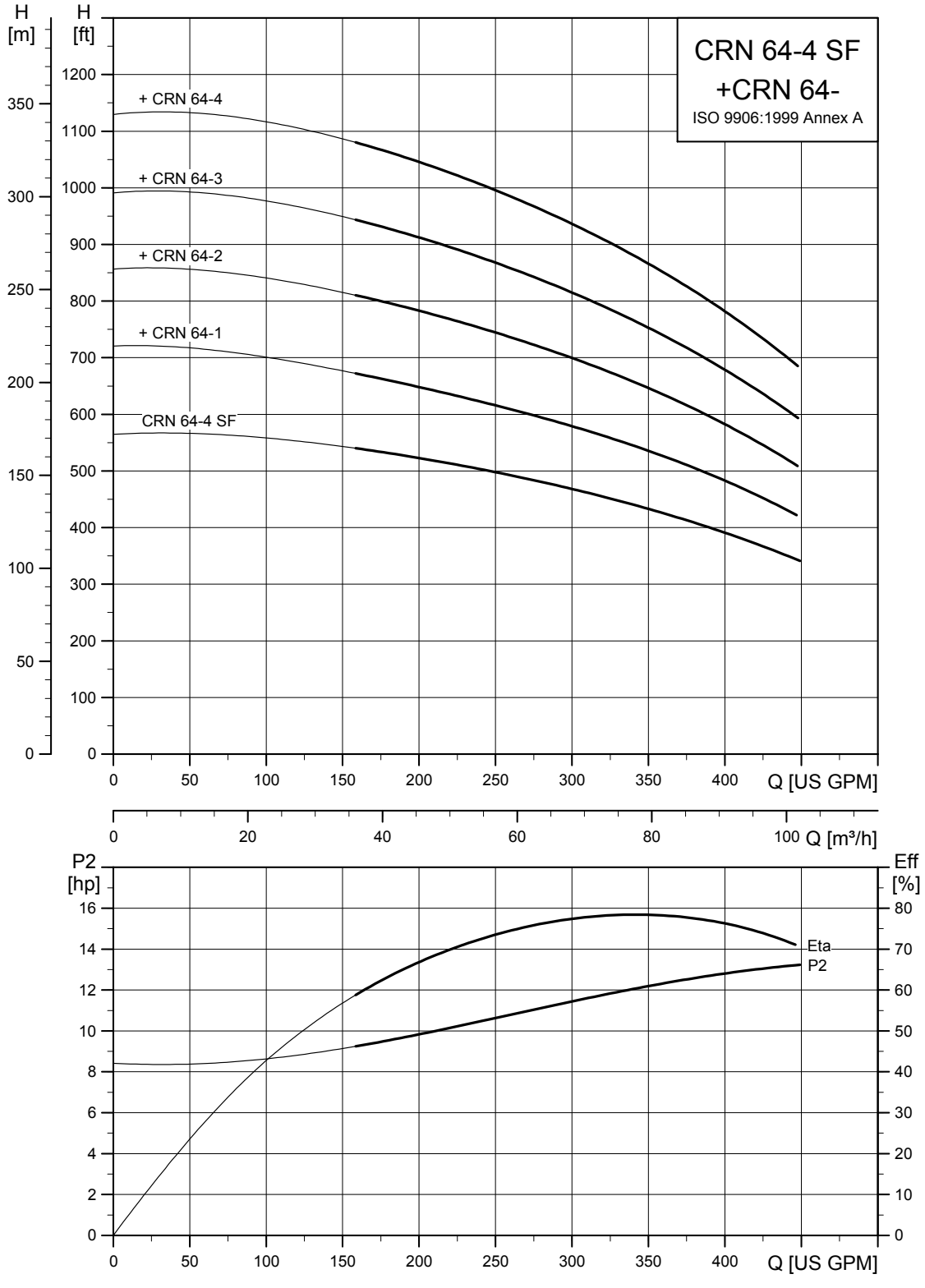
Dimensions and weights

Pump type	P2 (Hp)	Ph	ANSI Dimensions (inch)							Ship Wt. (lbs.)
			B1	TEFC			ODP			
				D1	D2	B1+B2	D1	D2	B1+B2	
CRN(E) 45-2	15	3	29.49	10.22	8.67	46.07	10.62	7.33	45.80	376
CRN(E) 45-3	25	3	32.64	12.94	11.52	52.46	11.50	8.94	53.45	436
CRN(E) 45-4	30	3	35.79	15.32	13.11	58.98	11.50	8.94	57.60	609
CRN 45-5	40	3	38.94	15.32	13.11	62.13	13.25	12.21	62.19	632
CRN 45-6	50	3	42.09	16.88	14.12	69.90	13.25	12.21	64.84	677
CRN 45-7 SF*	60	3	48.38	17.28	13.31	76.30	–	–	–	1185

[1] Weights are based on pump with TEFC motor (see price list for individual weights)
All dimensions in inches unless otherwise noted.

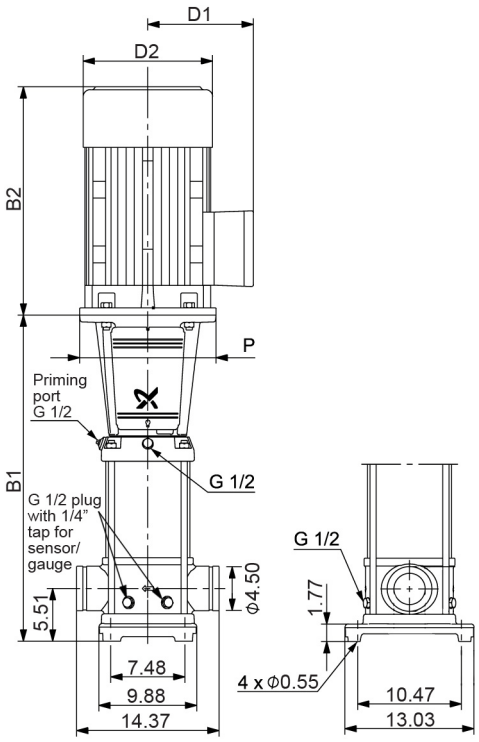
*High pressure pump

CRN 64 SF, 60 Hz



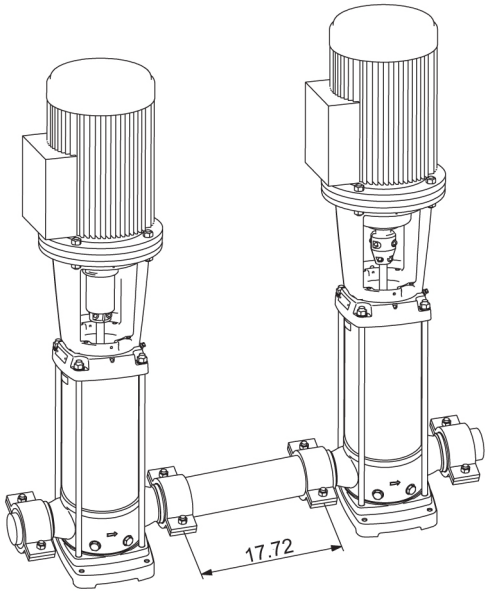
TM05 9551 1013

Dimensional sketches



CRN feed pump/CRN high-pressure pump

TM05 9464 0913



CRN feed pump, connecting pipe and CRN high-pressure pump

TM05 9465 0913

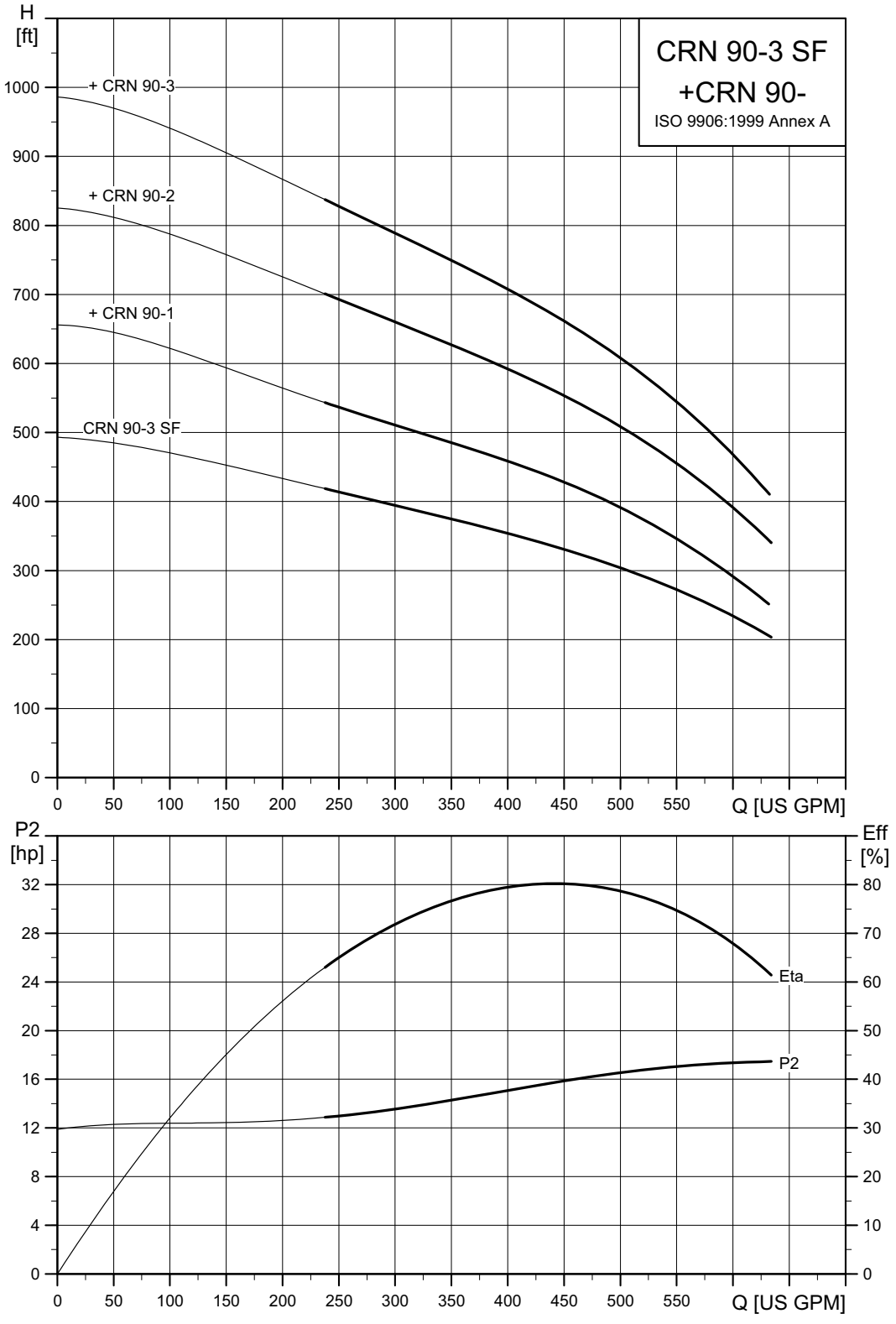
Dimensions and weights

Pump type	P2 (Hp)	Ph	ANSI Dimensions (inch)							Ship Wt. (lbs.)
			B1	TEFC			ODP			
				D1	D2	B1+B2	D1	D2	B1+B2	
CRN(E) 64-1	15	3	26.42	10.22	8.67	43.00	10.62	7.33	42.73	378
CRN(E) 64-2	25	3	29.69	12.94	11.52	49.51	11.50	8.94	50.50	440
CRN(E) 64-3	40	3	32.91	15.32	13.11	56.10	13.25	12.21	56.16	625
CRN 64-4	50	3	36.18	16.88	14.12	63.99	13.25	12.21	58.93	678
CRN 64-4 SF*	60	3	45.90	17.28	13.31	67.32	–	–	–	1056

[1)] Weights are based on pump with TEFC motor (see price list for individual weights)
All dimensions in inches unless otherwise noted.

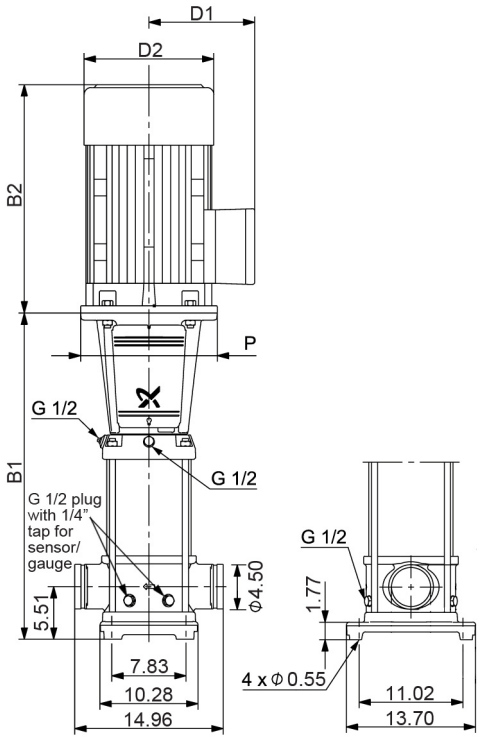
*High pressure pump

CRN 90 SF, 60 Hz



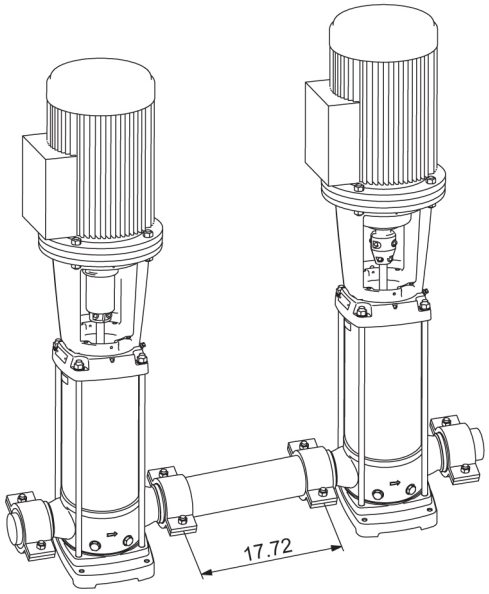
TM05 9552 1013

Dimensional sketches



CRN feed pump/CRN high-pressure pump

TM05 9466 0913



CRN feed pump, connecting pipe and CRN high-pressure pump

TM05 9467 0913

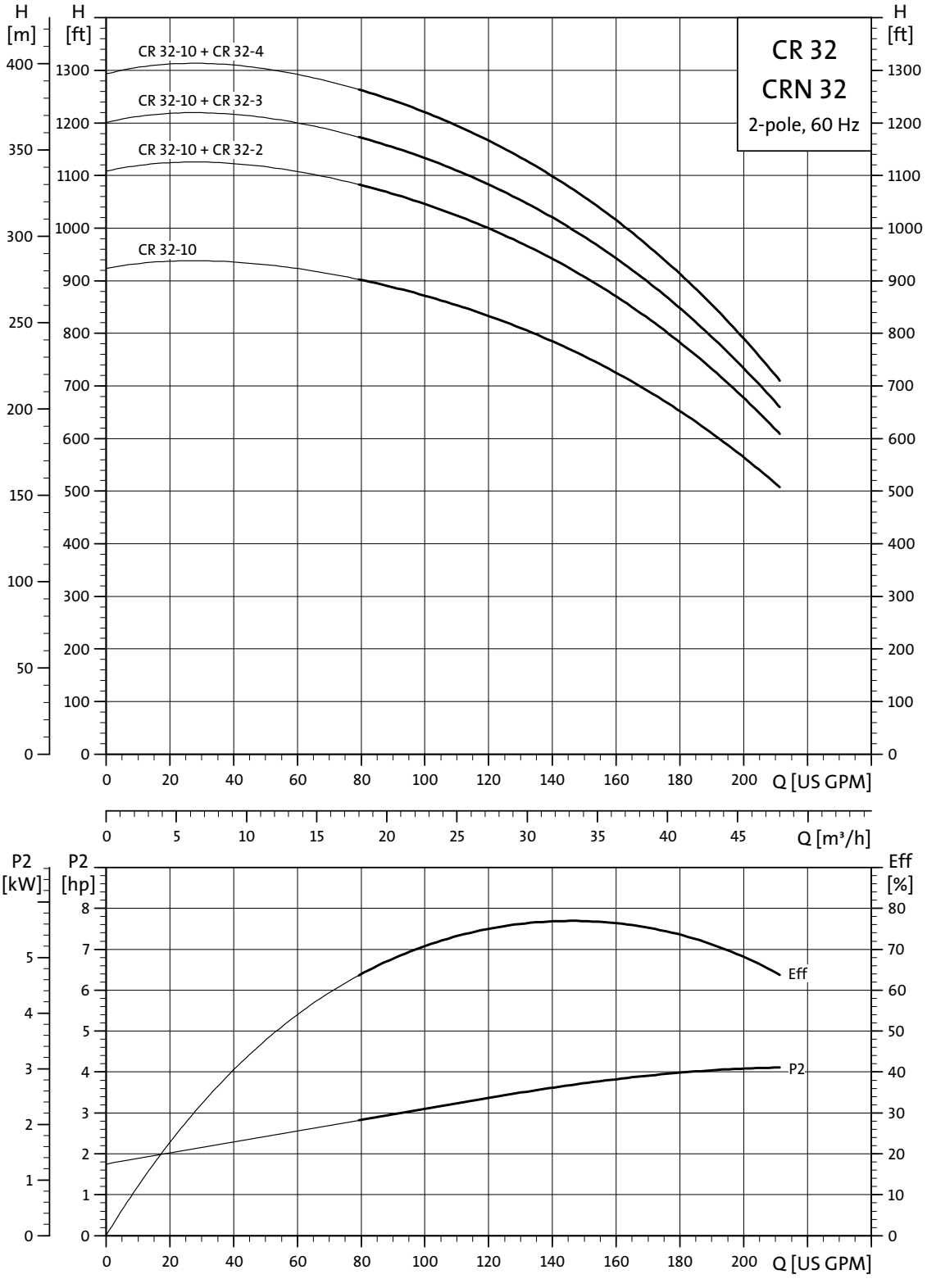
Dimensions and weights

Pump type	P2 (Hp)	Ph	ANSI Dimensions (inch)							Ship Wt. (lbs.)
			B1	TEFC			ODP			
				D1	D2	B1+B2	D1	D2	B1+B2	
CRN(E) 90-1	20	3	26.81	10.22	8.67	43.39	11.50	8.92	46.50	398
CRN 90-2	40	3	30.43	15.32	13.11	53.62	13.25	12.21	53.68	631
CRN 90-3	50	3	34.06	16.88	14.12	61.87	13.25	12.21	56.81	672
CRN 90-3 SF*	60	3	41.30	17.28	13.31	65.59	–	–	–	1065

[1] Weights are based on pump with TEFC motor (see price list for individual weights)
All dimensions in inches unless otherwise noted.

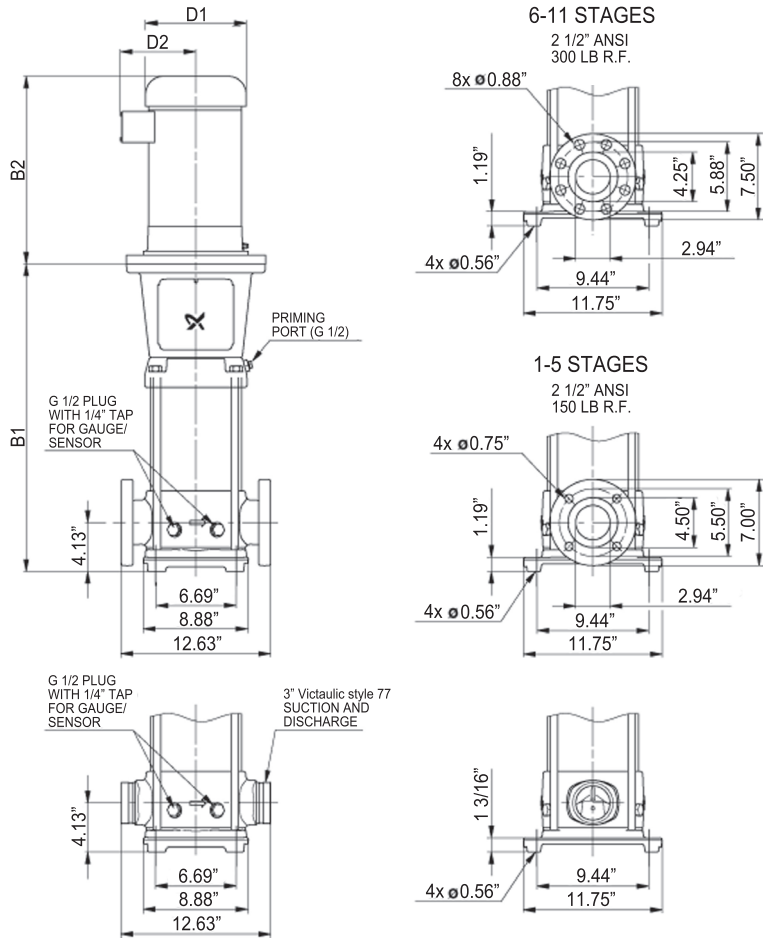
*High pressure pump

CR, CRN 32

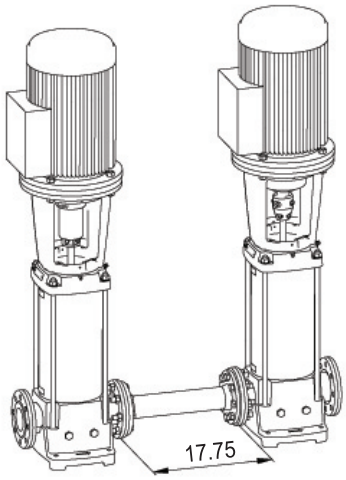


TM02 8314 2406

Dimensional sketches



CR, CRN feed pump/CR, CRN high-pressure pump



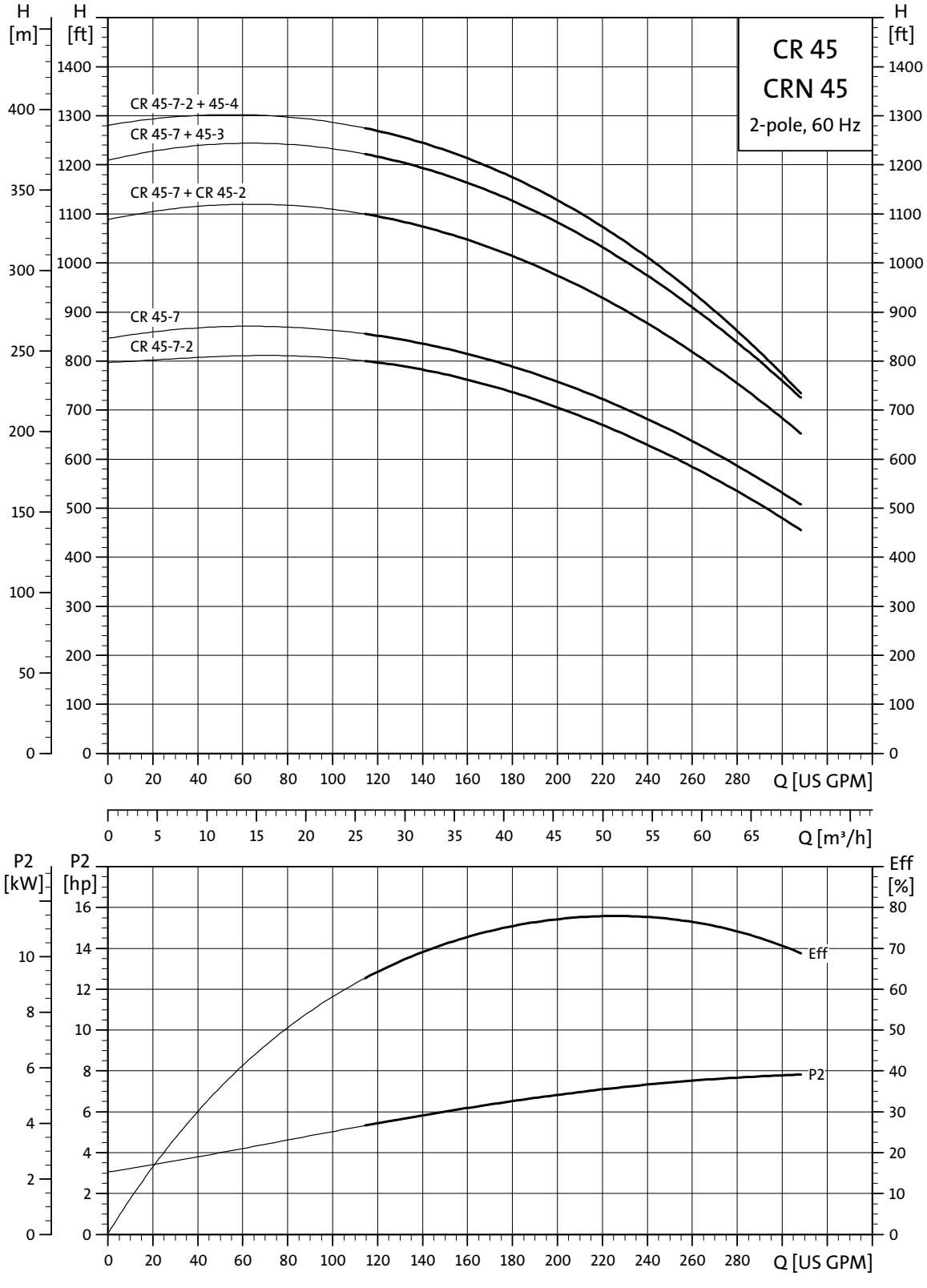
CR, CRN feed pump, connecting pipe and CR, CRN high-pressure pump

TM05 9717 1013 / TM05 9718 1013

Dimensions and weights

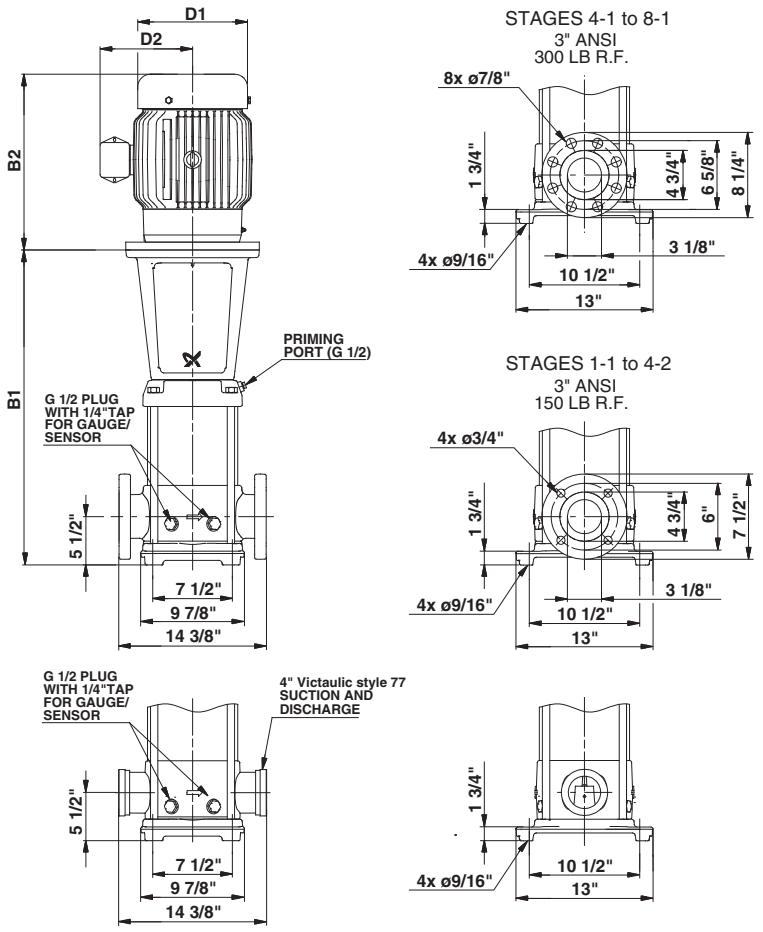
		Dimensions (in)							Ship weight (lbs)	
Pump type	P2 (hp)	Victaulic B1	ANSI B1	B2	Victaulic B1+B2	ANSI B1+B2	D1	D2	Victaulic	ANSI
CR, CRN 32-2	7 1/2	22 3/4	22 3/4	15 5/8	38 3/8	38 3/8	8 3/4	5 3/8	213	223
CR, CRN 32-3	15	29 3/4	29 3/4	16 5/8	46 3/8	46 3/8	10 3/8	8 3/4	412	422
CR, CRN 32-4	15	32 1/2	32 1/2	16 5/8	49 1/8	49 1/8	10 3/8	8 3/4	419	429
CR, CRN 32-10	40	49 1/8	49 1/8	23	72 1/8	72 1/8	15 3/8	13 1/8	828	844

CR, CRN 45

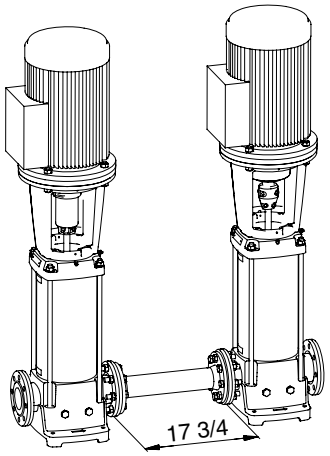


TM02 8316 2406

Dimensional sketches



CR, CRN feed pump / CR, CRN high pressure pump



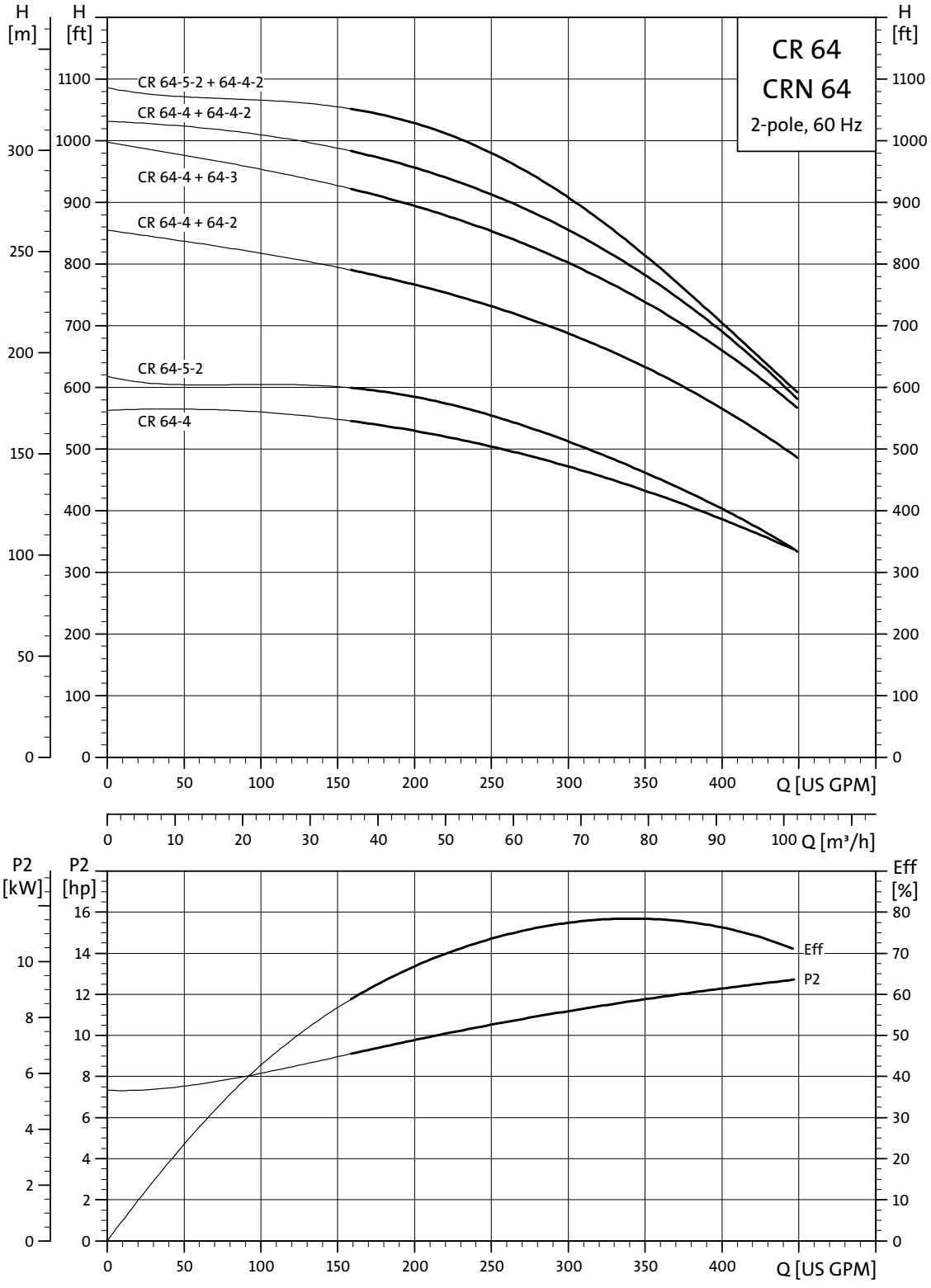
CR, CRN feed pump, connecting pipe and CR, CRN high pressure pump

TM03 4285 1906 - TM03 3414 0306

Dimensions and weights

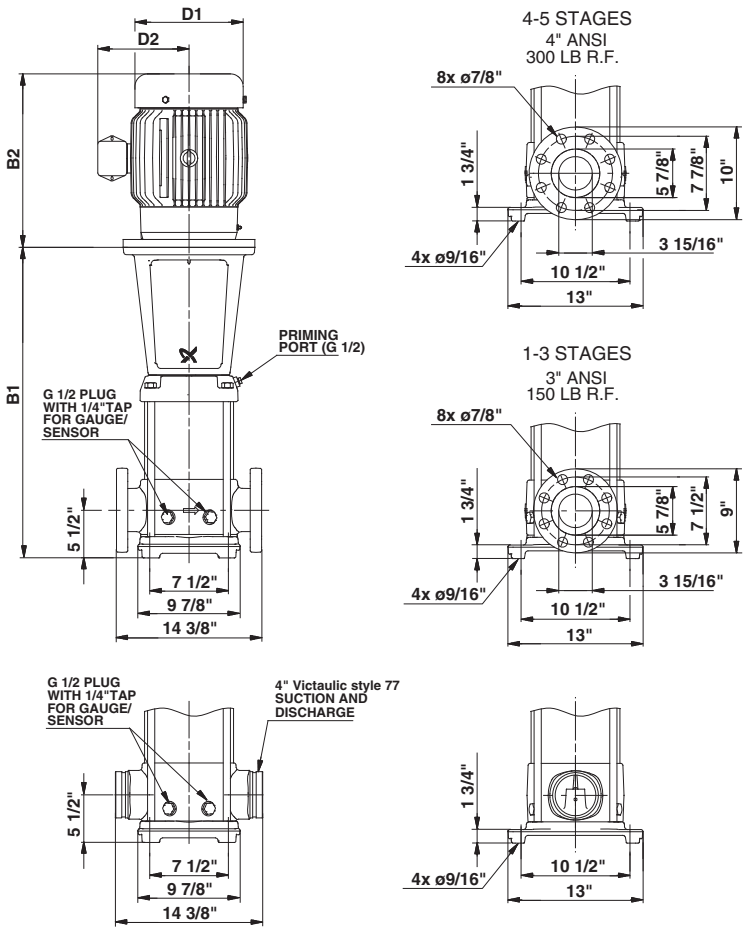
Pump type	Hp	Ph	Voltage [V]	NEMA Frame Size	PJE B1	ANSI B1	TEFC D1	TEFC D2	PJE TEFC B1+B2	ANSI TEFC B1+B2	ODP D1	ODP D2	PJE ODP B1+B2	ANSI ODP B1+B2	ANSI ship wt.[1] (lbs.)
CR, CRN 45-2	15	3	208-230/460	254TC	29.49	29.49	10.22	8.67	46.07	46.07	10.62	7.33	45.80	45.80	376
CR, CRN 45-3	25	3	230/460	284TSC	32.64	32.64	12.94	11.52	52.46	52.46	11.50	8.94	53.45	53.45	436
CR, CRN 45-4	30	3	230/460	284TSC	35.79	35.79	15.32	13.11	58.98	58.98	11.50	8.94	57.60	57.60	609
CR, CRN 45-7-2	50	3	230/460	324TSC	45.24	45.24	16.88	14.12	73.05	73.05	13.25	12.21	67.99	67.99	687
CR, CRN 45-7	60	3	230/460	364TSC	45.24	45.24	19.00	14.90	76.03	76.03	15.12	13.19	71.37	71.37	867

CR, CRN 64

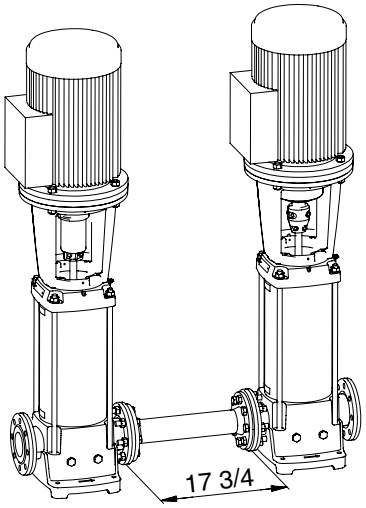


TM02 8318 2406

Dimensional sketches



CR, CRN feed pump / CR, CRN high pressure pump



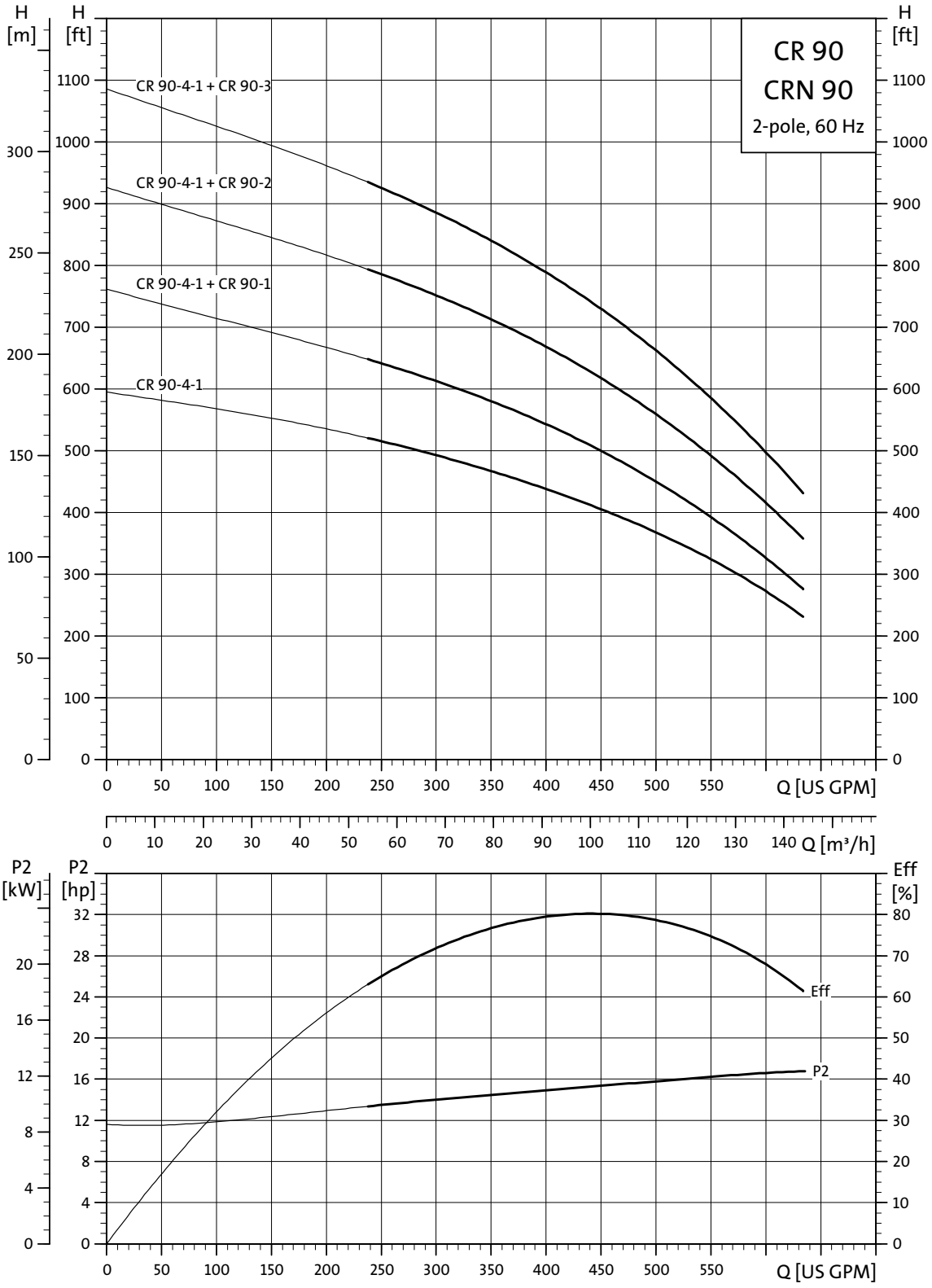
CR, CRN feed pump, connecting pipe and CR, CRN high pressure pump

TM03 4286 1906 - TM03 3414 0306

Dimensions and weights

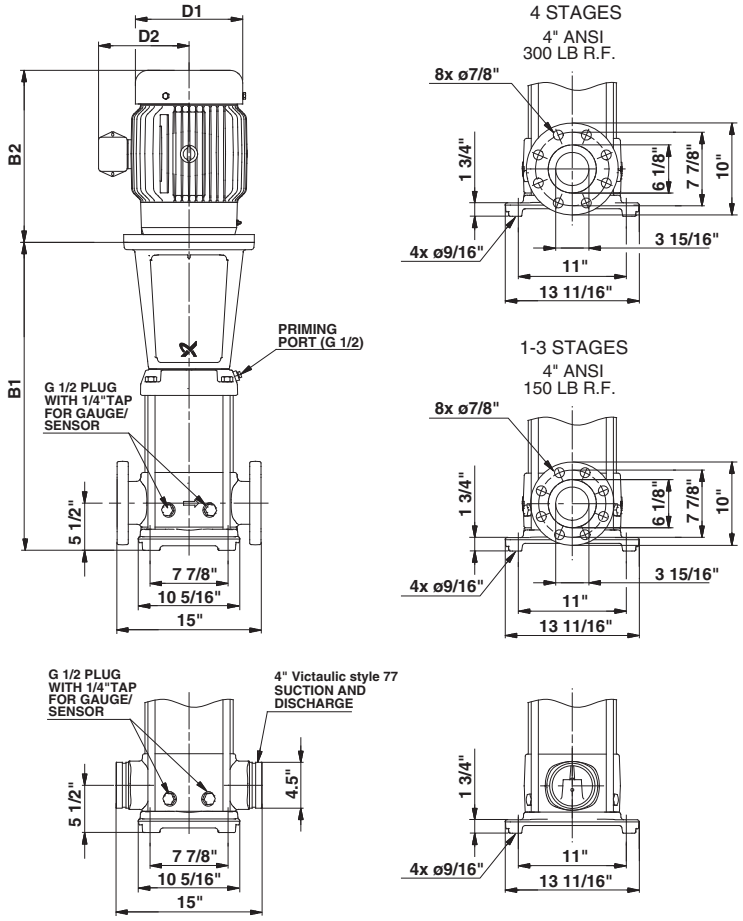
Pump type	Hp	Ph	Voltage [V]	NEMA Frame Size	PJE B1	ANSI B1	TEFC D1	TEFC D2	PJE TEFC B1+B2	ANSI TEFC B1+B2	ODP D1	ODP D2	PJE ODP B1+B2	ANSI ODP B1+B2	ANSI ship wt.[1] (lbs.)
CR, CRN 64-2	25	3	230/460	284TSC	29.69	29.69	12.94	11.52	49.51	49.51	11.50	8.94	50.50	50.50	440
CR, CRN 64-3	40	3	230/460	286TSC	32.91	32.91	15.32	13.11	56.10	56.10	13.25	12.21	56.16	56.16	625
CR, CRN 64-4-2	40	3	230/460	286TSC	36.18	36.18	15.32	13.11	59.37	59.37	13.25	12.21	59.43	59.43	625
CR, CRN 64-4	50	3	230/460	324TSC	36.18	36.18	16.88	14.12	63.99	63.99	13.25	12.21	58.93	58.93	678
CR, CRN 64-5-2	60	3	230/460	364TSC	39.41	39.41	19.00	14.90	70.20	70.20	15.12	13.19	65.54	65.54	868

CR, CRN 90

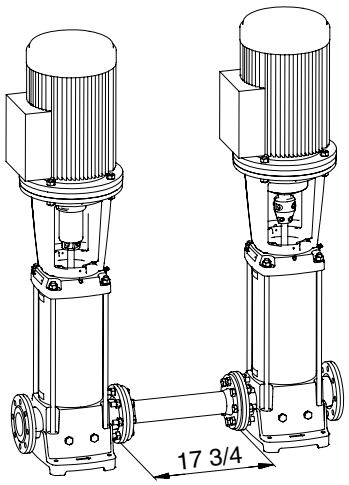


TM02 8320 2406

Dimensional sketches



CR, CRN feed pump / CR, CRN high pressure pump



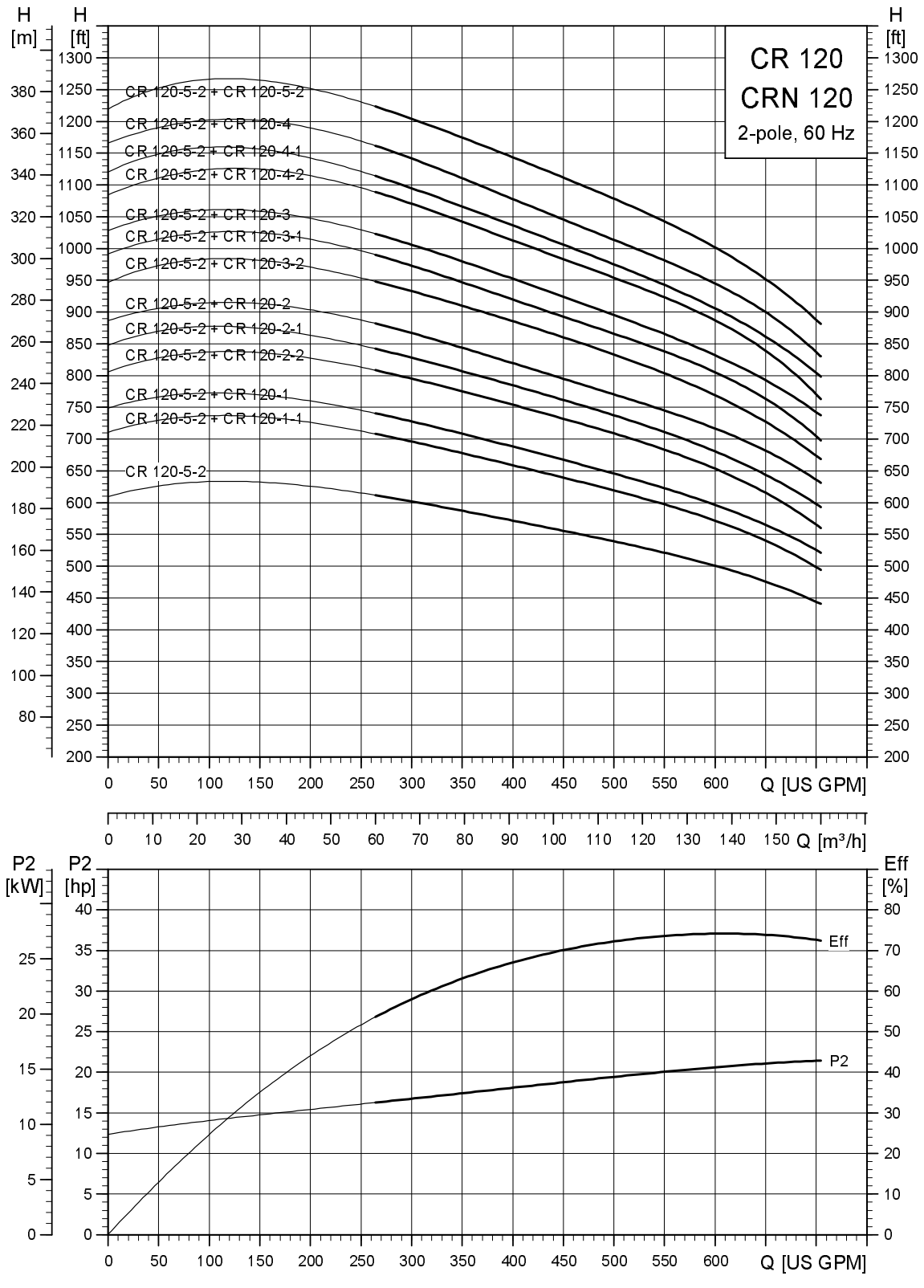
CR, CRN feed pump, connecting pipe and CR, CRN high pressure pump

TM03 4287 1906 - TM03 3414 0306

Dimensions and weights

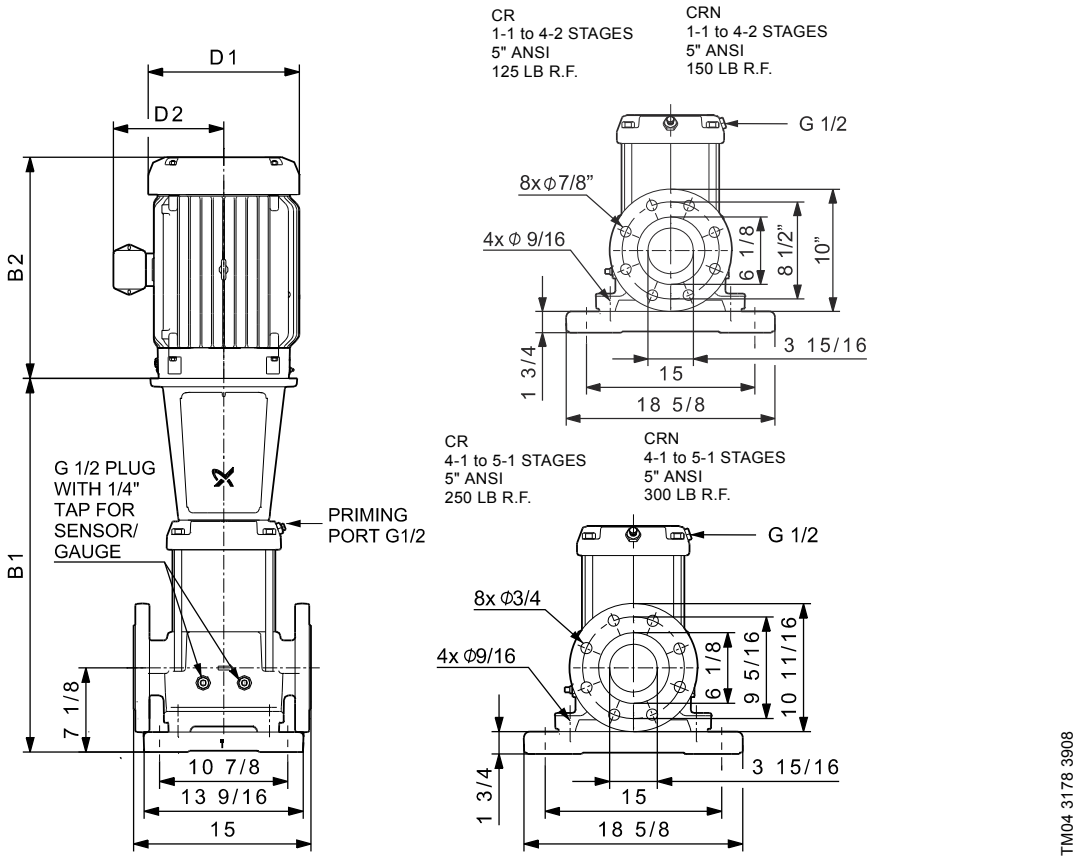
Pump type	Hp	Ph	Voltage [V]	NEMA Frame Size	PJE B1	ANSI B1	TEFC D1	TEFC D2	PJE TEFC B1+B2	ANSI TEFC B1+B2	ODP D1	ODP D2	PJE ODP B1+B2	ANSI ODP B1+B2	ANSI ship wt.[1] (lbs.)
CR, CRN 90-1	20	3	208-230/460	254TC	26.81	26.81	10.22	8.67	43.39	43.39	11.50	8.92	46.50	46.50	398
CR, CRN 90-2	40	3	230/460	286TSC	30.43	30.43	15.32	13.11	53.62	53.62	13.25	12.21	53.68	53.68	631
CR, CRN 90-3	50	3	230/460	324TSC	34.06	34.06	16.88	14.12	61.87	61.87	13.25	12.21	56.81	56.81	672
CR, CRN 90-4-1	60	3	230/460	364TSC	37.68	37.68	19.00	14.90	68.47	68.47	15.12	13.19	63.81	63.81	876

CR, CRN 120



TM04 5614

Dimensional sketches

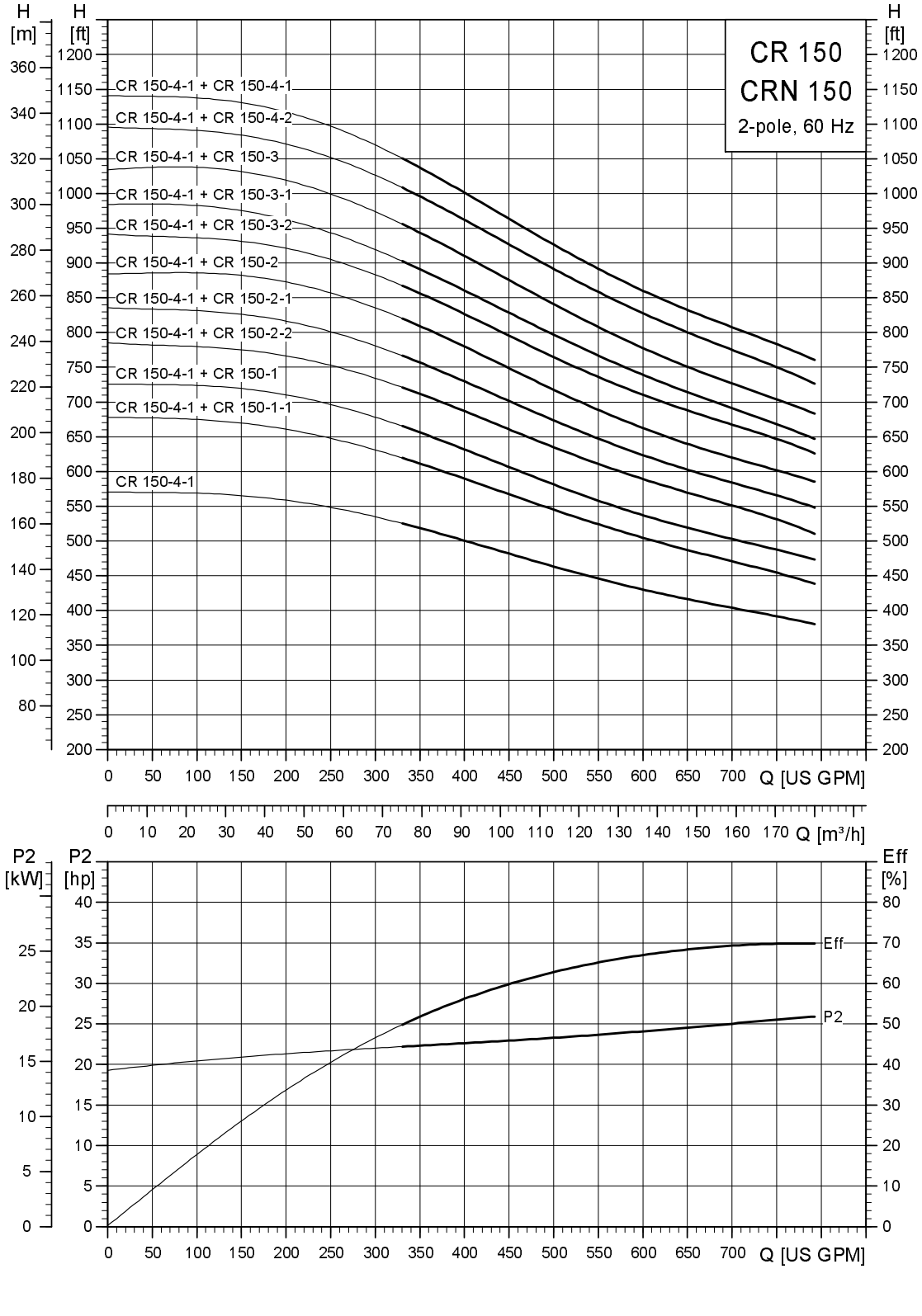


Dimensions and weights

Pump Type	Hp	Ph	Voltage [V]	NEMA Frame Size	ANSI B1	TEFC D1	TEFC D2	ANSI TEFC B1+B2	ODP D1	ODP D2	ANSI ODP B1+B2	ANSI Ship wt.[1] [lbs.]
CR, CRN 120-1-1	20	3	230/460	254TCZ	32.83	10.22	8.67	49.41	11.50	8.92	52.52	468
CR, CRN 120-1	25	3	230/460	284TSCZ	32.83	12.94	11.52	52.65	11.50	8.94	53.64	514
CR, CRN 120-2-2	40	3	230/460	284TSC	38.98	15.32	13.11	62.17	13.25	12.21	62.23	711
CR, CRN 120-2-1	40	3	230/460	284TSC	38.98	15.32	13.11	62.17	13.25	12.21	62.23	711
CR, CRN 120-2	50	3	230/460	326TSCZ	38.98	16.88	14.12	66.79	13.25	12.21	61.73	742
CR, CRN 120-3-2	60	3	230/460	364TSCZ	45.08	19.00	14.90	75.87	15.12	13.19	71.21	943
CR, CRN 120-3-1	60	3	230/460	364TSCZ	45.08	19.00	14.90	75.87	15.12	13.19	71.21	943
CR, CRN 120-3	75	3	230/460	365TSCZ	45.08	19.00	14.90	75.87	15.18	13.19	71.21	1052
CR, CRN 120-4-2	75	3	230/460	365TSCZ	51.69	19.00	14.90	82.48	15.18	13.19	77.82	1206
CR, CRN 120-4-1	100	3	230/460	405TSCZ	51.69	19.00	17.38	82.51	15.12	13.19	79.07	1475
CR, CRN 120-4	100	3	230/460	405TSCZ	51.69	19.00	17.38	82.51	15.12	13.19	79.07	1475
CR, CRN 120-5-2	100	3	230/460	405TSCZ	57.8	19.00	17.38	88.62	15.12	13.19	85.18	1497

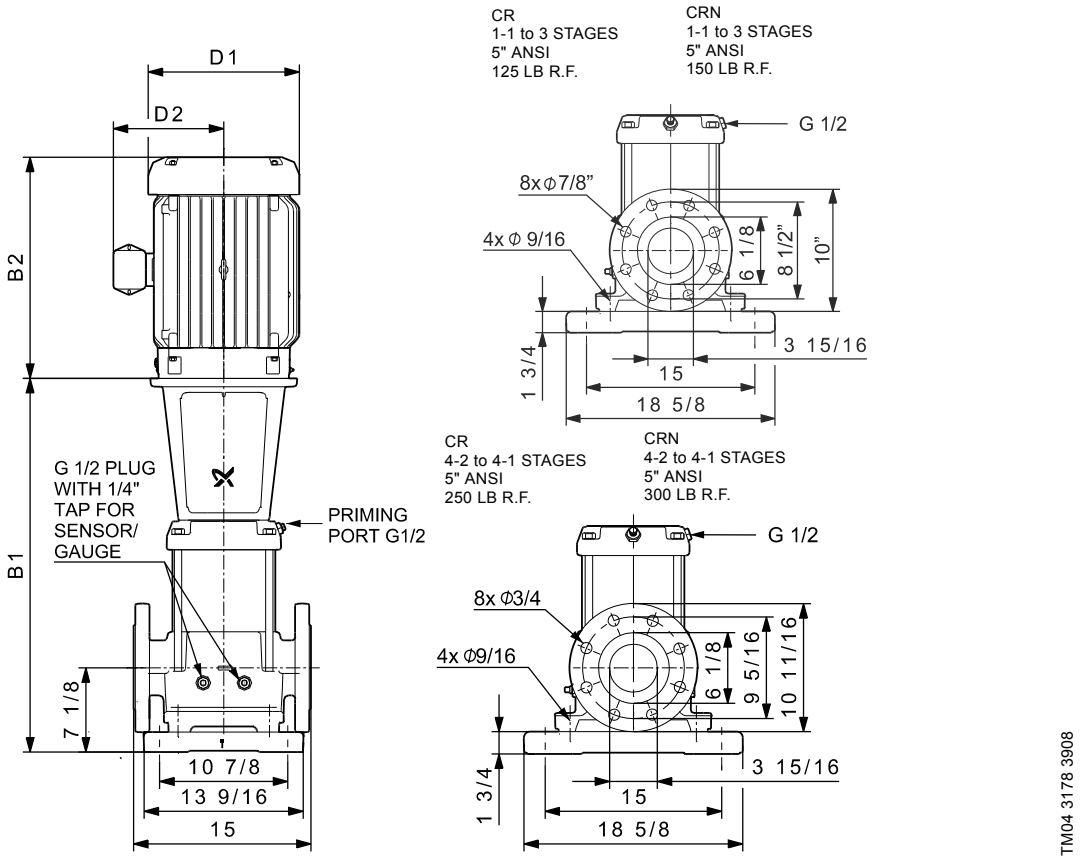
All dimensions in inches unless otherwise noted.

CR, CRN 150



TM04 5615

Dimensional sketches



TM04 3178 3908

Dimensions and weights

Pump Type	Hp	Ph	Voltage [V]	NEMA Frame Size	ANSI B1	TEFC D1	TEFC D2	ANSI TEFC B1+B2	ODP D1	OPD D2	ANSI ODP B1+B2	ANSI Ship wt.[1] [lbs.]
CR, CRN 150-1-1	25	3	230/460	284TSCZ	32.83	12.94	11.52	52.65	11.50	8.94	53.64	514
CR, CRN 150-1	30	3	230/460	284TSCZ	32.83	15.32	13.11	56.02	11.50	8.94	54.64	675
CR, CRN 150-2-2	40	3	230/460	284TSC	38.98	15.32	13.11	62.17	13.25	12.21	62.23	711
CR, CRN 150-2-1	50	3	230/460	326TSCZ	38.98	16.88	14.12	66.79	13.25	12.21	61.73	741
CR, CRN 150-2	60	3	230/460	364TSCZ	38.98	19.00	14.90	69.77	15.12	13.19	65.11	922
CR, CRN 150-3-2	75	3	230/460	365TSCZ	45.55	19.00	14.90	76.34	15.18	13.19	71.68	1184
CR, CRN 150-3-1	75	3	230/460	365TSCZ	45.55	19.00	14.90	76.34	15.18	13.19	71.68	1184
CR, CRN 150-3	100	3	230/460	405TSCZ	45.55	19.00	17.38	76.37	15.12	13.19	72.93	1222
CR, CRN 150-4-2	100	3	230/460	405TSCZ	51.69	19.00	17.38	82.51	15.12	13.19	79.07	1243
CR, CRN 150-4-1	100	3	230/460	405TSCZ	51.69	19.00	17.38	82.51	15.12	13.19	79.07	1243

4. Motor data

Standard motors for CR, CRN high pressure, 60 Hz

Motors for CRN 5, 10, 15, 20 feed pumps and for CR, CRN 32, 45, 64, 90, 120, 150 feed and high pressure pumps

Hp	Ph	Frame	S.F.	Voltage [V]	Mtr. Eff. [%]	Insul. class	KVA code	Full load current [A]	Service Factor current [A]	Start current [A]	Motor type
1.5	3	56C	1.15	208-230/460	84	F	M	4.7-4.6/2.3	5.2-5.1/2.55	33.8-36.8/18.4	ML
2	3	56C	1.15	208-230/460	85.5	F	G	5.7-5.4/2.7	6.55-6.1/3.05	46.2-48.6/24.3	ML
3	3	182TC	1.15	208-230/460	86.5	F	M	8.4-7.7/3.9	9.5-8.6/4.3	79.0-80.1/40.6	ML
5	3	182TC	1.15	208-230/460	88.5	F	L	13.8-13.0/6.5	15.6-14.6/7.3	124-129/64.4	ML
7.5	3	213TC	1.15	208-230/460	90	F	N	20.4-19.4/9.7	23-21.5/10.8	192-202/101	ML
10	3	213TC	1.15	208-230/460	90.2	F	L	26.5-25.5/12.8	30.5-28.5/14.5	239-252/127	ML

ML motor

GR 7845

15	3	254TCZ	1.15	208-230/460	90.2	F	K	37.5-34/17	42.5-39/19.5	270-304/152	Baldor
20	3	254TCZ	1.15	208-230/460	90.2	F	K	47-46/23	53-52/26	355-412/206	Baldor
25	3	284TSCZ	1.15	230/460	91	F	J	56/28	64/32	498/249	Baldor
30	3	286TSCZ	1.15	230/460	91	F	G	70/35	78/39	450/225	Baldor
40	3	286TSC	1.15	230/460	91.7	F	G	88/44	102/51	614/307	Baldor
50	3	326TSCZ	1.15	230/460	93	F	G	110/55	128/64	746/393	Baldor
60	3	364TSCZ	1.15	230/460	93	F	G	134/67	154/77	918/459	Baldor
75	3	365TSCZ	1.15	230/460	93	F	G	166/83	188/94	1162/581	Baldor
100	3	405TSCZ	1.15	230/460	93.6	F	G	216/108	246/123	1422/711	Baldor

Baldor motor

GR 7845

All motors are TEFC (Totally Enclosed Fan Cooled, constant speed).
The motors are recognized under the component recognition program of the Underwriters Laboratories Inc. for the United States and Canada.

Motors for CRN-SF 5, 10, 15, 20, 32, 45, 64 and 90 high pressure pumps

HP	Ph	Frame	S.F.	Voltage [V]	Insul. class	Full load current [A]	Motor type
10	3	132SB	1.0	480	F	12.0	MG
15	3	160MB	1.0	480	F	17.2	MG
20	3	160MD	1.0	480	F	22.8	MG
25	3	160LB	1.0	480	F	28.0	MG
30	3	200L	1.0	480	F	50.00	Siemens
45	3	225M	1.0	480	F	74.0	Siemens

GR 7845

All motors are IP 55 (similar to TEFC wash-down duty).

Motors for horizontally mounted CR(N) 32 pumps

Motor	Hp	Ph	Frame	S.F.	Voltage [V]	Insul. Class	KVA Code	Motor Type
TEFC	50	3	326TSCZ	1.15	230/460	F	G	Baldor
	60	3	364TSCZ	1.15	230/460	F	G	Baldor
ODP	50	3	326TSCZ	1.15	230/460	F	G	Baldor
	60	3	364TSCZ	1.15	230/460	F	G	Baldor

TM04 9211

MLE-motors for CRNE-HS 1 and 3 (Integrated variable frequency drive)

Hp	Ph	Frame	S.F.	Voltage [V]	Mtr. eff. %	Insul. class	Full load current	RPM CRNE 1-23	RPM CRNE 3-23	Motor type
6.2	3	112 CA	1.15	460-480	83	F	7.7-7.4	4800	4100	MLE
8.0	3	112 CB	1.15	460-480	84	F	9.9-9.5	5200	4500	MLE
10.0	3	112 DA	1.15	460-480	86	F	12.2-11.6	5500	4800	MLE

MLE motor

TM03 1712 2805

Note: MTR Eff. Is the total efficiency for the motor and variable frequency drive.
All motors are IP 55 (similar to TEFC wash-down duty).
The MLE motors are recognized under the component recognition program of the Underwriters Laboratories Inc. for the United States and Canada.

5. Accessories

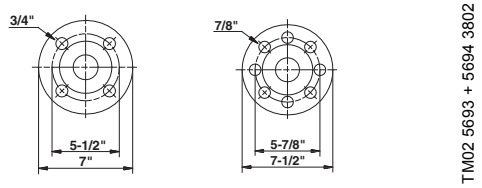
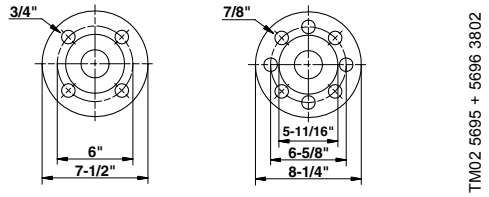
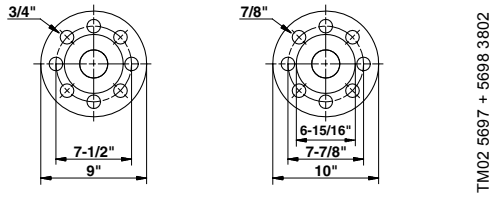
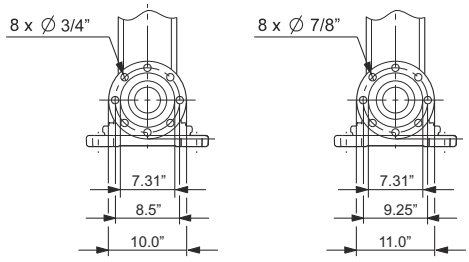
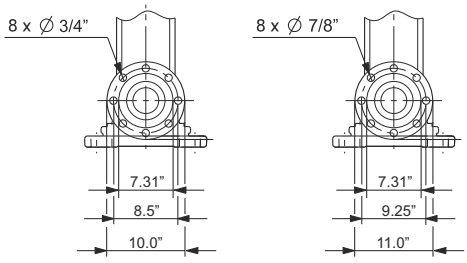
Pipework connection

For pipework connection, various sets of counter flanges and couplings are available.

CR, CRN counter flanges

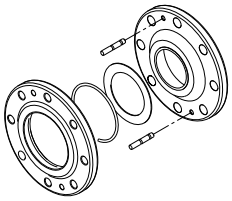
Counter flanges for CR, CRN pumps are made of stainless steel according to AISI 316.

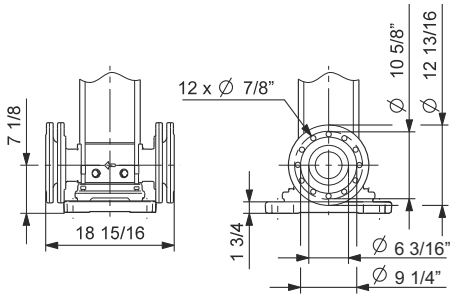
A set consists of two counter flanges, two gaskets, bolts and nuts.

	TM02 5693 + 5694 3802	**CR 32** **CRN 32**	Threaded	ANSI 150 lb.	2½" NPT	91121951
			Threaded	ANSI 300 lb.	2½" NPT	0ID00138
	TM02 5695 + 5696 3802	**CR 45** **CRN 45**	Threaded	ANSI 150 lb.	3" NPT	91121953
			Threaded	ANSI 300 lb.	3" NPT	91121954
	TM02 5697 + 5698 3802	**CR 64** **CRN 64**	Threaded	ANSI 150 lb.	4" NPT	0ID00148
		CR 90 **CRN 90**	Threaded	ANSI 300 lb.	4" NPT	91121955
		**CR(E) 120** **CR(E) 150**	Threaded	ANSI 125 lb.	5" NPT	91121956
			Threaded	ANSI 250 lb.	5" NPT	91121957
		**CRN(E) 120** **CRN(E) 150**	Threaded	ANSI 150 lb.	5" NPT	91121958
			Threaded	ANSI 300 lb.	5" NPT	91121959

Adapter kit

6” flanges are available for CR, CRN 120 and 150 pumps. To use 6” flanges, two adapter kits must be ordered per pump.

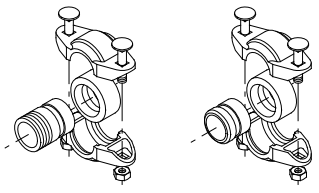
Adapter kit	Pump type	Pipe connection	Number of flange kits needed	Product number
 TM04 0021 4807	**CR 120** **CR 150**	6” RF 250 lb. Ductile iron	2	96638184
	CRN 120 **CRN 150**	6” RF 300 lb. ANSI 316 SS	2	96638186



Victaulic® type couplings with pipe stub

Couplings for CRN pumps are made of stainless steel according to AISI 316 (EN 1.4401).

A coupling set consists of a victaulic type coupling (style 77), rubber bushing, pipe stub, bolts and nuts. The number of sets needed for a complete pump is stated in fig. 18.



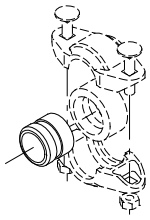
Coupling sets	Pump type	Pipe stub	Rated pressure	Pipework connection	Rubber parts	Number of coupling sets needed	Product number
	CRNE-HS 1 CRNE-HS 3 CRN 5-SF	Threaded	1000 psi	1¼" NPT	EPDM	1*	4013010
					FKM	1*	0ID00118
		For welding	1000 psi	1¼"	EPDM	2	419912
					FKM	2	419904
	CRN 10-SF CRN 15-SF CRN 20-SF	Threaded	1000 psi	2" NPT	EPDM	1*	331301
					FKM	1*	0ID00128
		For welding	1000 psi	2"	EPDM	2	339910
					FKM	2	339917
	CRN 32-SF	For welding	1000 psi	3"	EPDM	2	98144746
					FKM	2	98144749
	CRN 45-SF CRN 64-SF	For welding	1000 psi	4"	EPDM	2	98144746
					FKM	2	98144755
	CRN 90-SF	For welding	1000 psi	4"	EPDM	2	98144746
					FKM	2	98144755

Fig. 18 Victaulic type couplings (style 77) with pipe stubs for threaded or welded pipework connection

* Includes two sets of Victaulic type couplings and pipe stubs

Victaulic® type pipe stub

Pipe stubs for CRN pumps are made of stainless steel to AISI 316 (EN 1.4401).



Pipe stub	Pump type	Rated pressure	Pipework connection	Product number
	CRN 32	1000 psi	3"	00150574
	CRN 45 CRN 64 CRN 90 CRN 120 CRN 150	1000 psi	4"	96416743

Fig. 19 Victaulic type pipe stub for welded pipework connection

Victaulic® type coupling

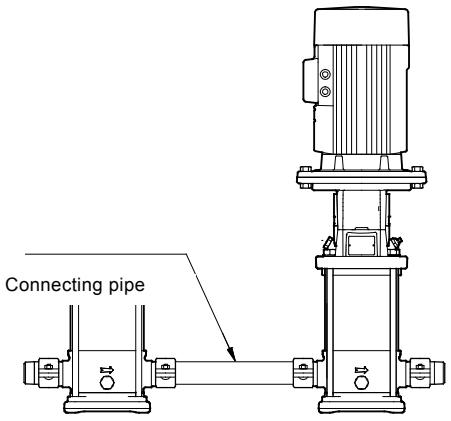
A set includes one coupling (style 77), rubber bushing, bolts and nuts.

Coupling	Pump type	Rated pressure	Pipework connection	Product number		
				EPDM	FKM	NBR
	CRNE-HS 1 CRNE-HS 3 CRN 5-SF	1000 psi	1¼"	0ID1781	00ID6742	-
	CRN 10-SF CRN 15-SF CRN 20-SF	1000 psi	2"	00ID2643	00ID6743	-
	CRN 32 SF	1000 psi	3"	ID5530	ID8311	-
	CRN 45 SF CRN 64 SF CRN 90 SF	1000 psi	4"	96483370	96428783	-
	CRN 32	1000 psi	3"	-	-	00ID7664
	CRN 45 CRN 64 CRN 90 CRN120 CRN150	1000 psi	4"	-	-	96415463

Fig. 20 Victaulic type coupling (style 77)

Note: Victaulic® is a registered trademark of Victaulic.

Connecting pipe



TM01 1984 1906

Pump type	Pipework connection	Pipework type	Product number
CRN 5 SF	1 1/4"	Victaulic type (style 77)	400132
CRN 10 SF **CRN 15 SF** **CRN 20 SF**	2"		420138
CRN 32 SF	3"		98144757
CRN 45 SF **CRN 64 SF** **CRN 90 SF**	4"		98144759
CR, CRN 32	2 1/2"	ANSI	on request
	3"	Victaulic type (style 77)	on request
CR, CRN 45	3"	ANSI	on request
	4"	Victaulic type (style 77)	on request
CR, CRN 64 **CR, CRN 90**	4"	ANSI	on request
	4"	Victaulic type (style77)	on request
CR, CRN 120 **CR, CRN 150**	5"	ANSI	on request
	4"	Victaulic type (style77)	on request

Fig. 21 CRN pumps with 316 stainless steel connecting pipe

Pressure sensor for CRNE-HS

Pump type	Pressure range	Product number
CRNE 1, 3 HS	0-870 psi	91136174

Pressure sensor include a 6 ft cable.

A priming valve with hollow stem is required when ordering a pressure sensor (product number 96527050).

LiqTec^{TM}

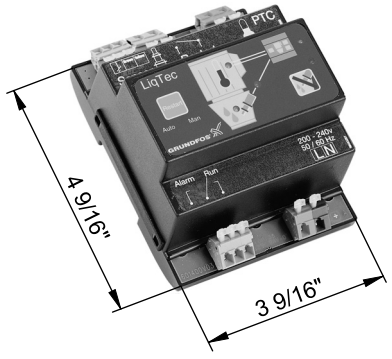
A dry-running protection device. The Grundfos LiqTec stops the pump immediately

- if there is no liquid in the pump (dry-running)
- if the liquid temperature exceeds 266 °F ±9 °F.

When connected to the PTC sensors in the motor, the LiqTec also protects the motor against overheating.

LiqTec is prepared for DIN rail mounting in a control cabinet.

Enclosure class: IP X0.



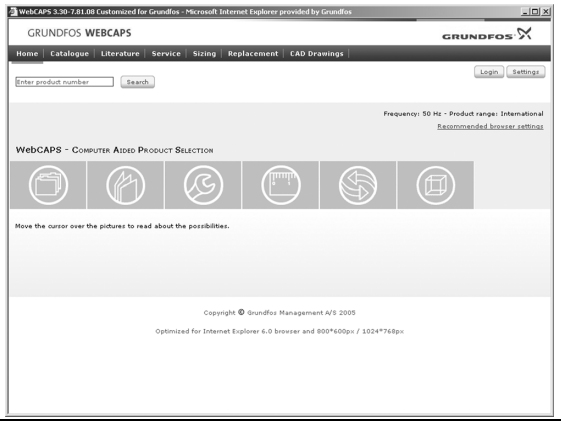
TM02 8872 1004

Dry-running protection	Pump type	Voltage [V]	LiqTec	Sensor ½"	Cable 16.4 ft	Extension cable 49.2 ft	Product number
	CR, CRN	200-240	●	●	●	-	96556429
		80-130	●	●	●	-	96556430
		-	-	-	-	●	96443676

Fig. 22 Dimensions of the Liqtec

6. Further documentation

WebCAPS

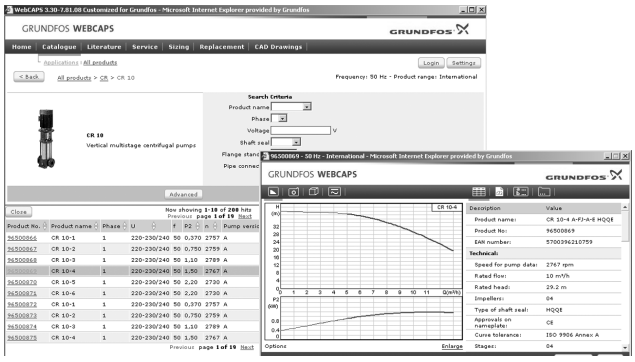


WebCAPS is a **Web**-based **C**omputer **A**ided **P**roduct **S**election program available on www.grundfos.com.

WebCAPS contains detailed information on more than 220,000 Grundfos products in more than 22 languages.

In WebCAPS, all information is divided into 6 sections:

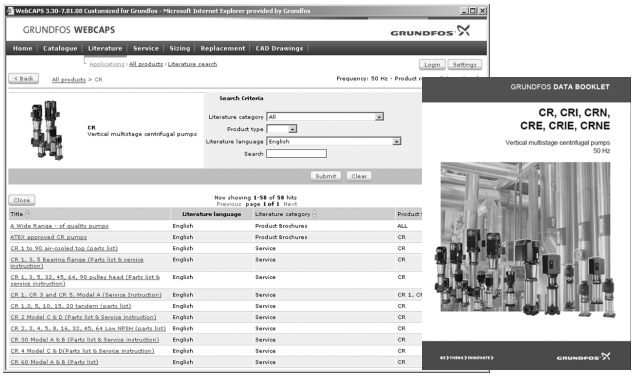
- Catalog
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalog

This section is based on fields of application and pump types, and contains

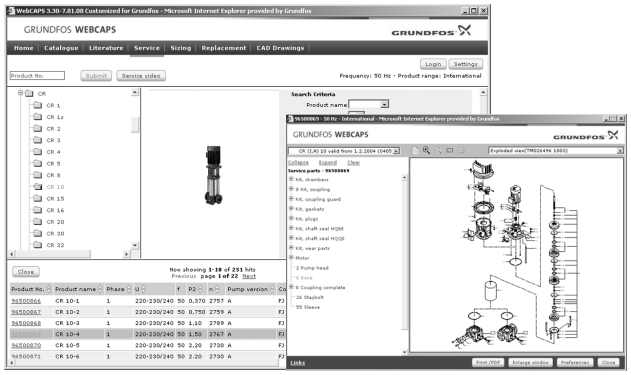
- technical data
- curves (QH, Eta, P1, P2, etc) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

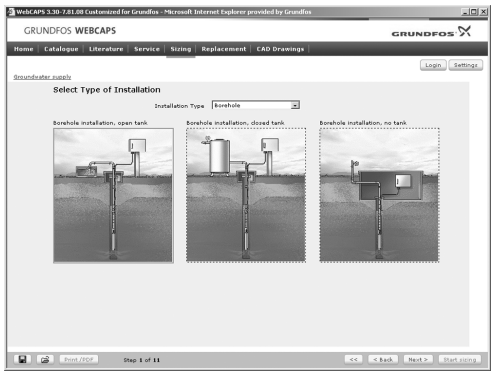
In this section you can access all the latest documents of a given pump, such as

- data booklets
- installation and operating instructions
- service documentation, such as Service kit catalog and Service kit instructions
- quick guides
- product brochures, etc.



Service

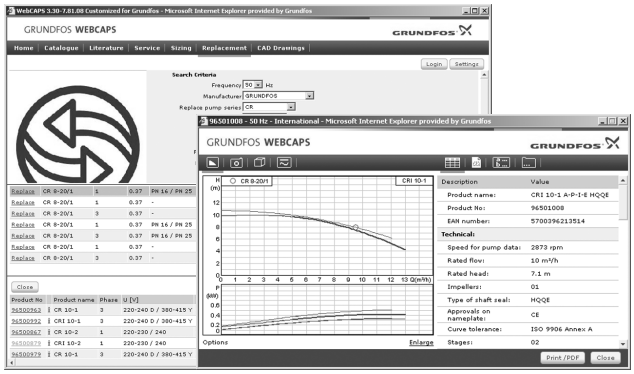
This section contains an easy-to-use interactive service catalog. Here you can find and identify service parts of both existing and discontinued Grundfos pumps.
Furthermore, this section contains service videos showing you how to replace service parts.



Sizing

This section is based on different fields of application and installation examples, and gives easy step-by-step instructions in how to

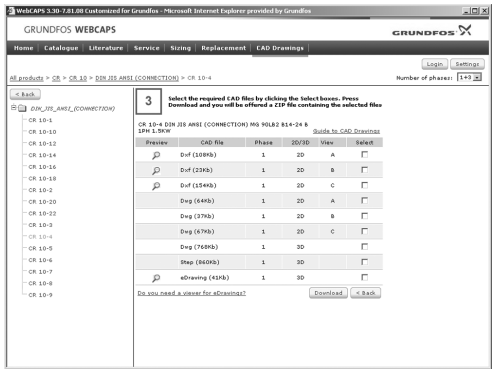
- select the most suitable and efficient pump for your installation
- carry out advanced calculations based on energy consumption, payback periods, load profiles, life cycle costs, etc.
- analyze your selected pump via the built-in life cycle cost tool
- determine the flow velocity in wastewater applications, etc.



Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump.
The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.



CAD drawings

In this section it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

2-dimensional drawings:

- .dxf, wireframe drawings
- .dwg, wireframe drawings.

3-dimensional drawings:

- .dwg, wireframe drawings (without surfaces)
- .stp, solid drawings (with surfaces)
- .eprt, E-drawings.

WinCAPS

WinCAPS is a **Win**dows-based **C**omputer **A**ided **P**roduct **S**election program containing detailed information on more than 220,000 Grundfos products in more than 22 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no Internet connection is available.

WinCAPS is available on CD-ROM and updated once a year.

L-CR-PG-004

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