

#### OVERVIEW

Specifications and operating parameters are shown below. For additional information, see *Operating parameters*, page 13, *System design parameters*, page 16, *Product coding*, page 23, *Features and options*, page 25 and *Control options*, page 41.

#### GENERAL

<b>Product line</b>	Series 40 Pumps
<b>Pump type</b>	In-line, axial piston, variable, positive displacement pumps
<b>Direction rotation</b>	Clockwise (CW) or counterclockwise (CCW) available
<b>Installation position</b>	Discretionary, the housing must be filled with hydraulic fluid
<b>Filtration configuration</b>	Suction or charge pressure filtration
<b>Other system requirements</b>	Independent braking system, suitable reservoir and heat exchanger

#### FEATURES

Model	Unit	M25 PV	M35 PV	M44 PV	M46 PV	M25 PT	M35 PT	M44 PT	M46 PT
<b>Type of mounting</b>		SAE B	SAE B	SAE B	SAE B	SAE B	SAE B	SAE B	SAE B
<b>Port connections</b>		Twin	Twin	Twin	Twin	Twin	Twin	Twin	Twin
<b>Integral charge pump (std)</b>	cm <sup>3</sup> /rev [in <sup>3</sup> /rev]	-	11.8 [0.72]	11.8 [0.72]	13.9 [0.85]	-	16.4 [1.00]	16.4 [1.00]	22.9 [1.40]
<b>Charge relief valve setting</b>	bar [psi]	14.0 [200]	14.0 [200]	14.0 [200]	19.5 [285]	14.0 [200]	14.0 [200]	14.0 [200]	19.5 [285]
<b>System pressure regulation</b>	bar [psi]	140-345 [2030-5000]							
<b>Displacement limiters</b>		-	-	-	Option	-	-	-	Option
<b>Input shaft option</b>		Splined, Tapered, or Straight Key							
<b>Auxiliary mounting pad</b>		SAE A	SAE A SAE B	SAE A SAE B	SAE A SAE B	SAE A	SAE A SAE B	SAE A SAE B	SAE A SAE B
<b>Control options</b>		DDC	DDC	DDC	MDC, HDC, EDC, FNR	DDC	DDC	DDC	MDC, HDC, EDC, FNR
<b>Filtration configuration</b>		Suction Filtration or Remote Charge Pressure Filtration							

#### SPECIFICATIONS

Model	Unit	M25 PV	M35 PV	M44 PV	M46 PV	M25 PT	M35 PT	M44 PT	M46 PT
<b>Pump configuration</b>		Single variable pump				Tandem variable pump			
<b>Displacement</b>	cm <sup>3</sup> /rev [in <sup>3</sup> /rev]	24.6 [1.50]	35.0 [2.14]	43.5 [2.65]	46.0 [2.81]	24.6 x 2 [1.50 x 2]	35.0 x 2 [2.14 x 2]	43.5 x 2 [2.65 x 2]	46.0 x 2 [2.81 x 2]
<b>Weight</b>	kg [lb]	19 [41.5]	25 [55]	25 [55]	33 [73]	24 [56]	45 [99]	45 [99]	59 [131]
<b>Mass moment of inertia</b>	kg·m <sup>2</sup> [slug·ft <sup>2</sup> ]	0.0018 [0.0014]	0.0033 [0.0024]	0.0032 [0.0023]	0.0050 [0.0037]	0.0037 [0.0028]	0.0066 [0.0048]	0.0064 [0.0047]	0.0100 [0.0073]

**OPERATING  
 PARAMETERS**

Model	Unit	M25 PV	M35 PV	M44 PV	M46 PV	M25 PT	M35 PT	M44 PT	M46 PT
<b>Case pressure</b>									
Continuous	bar [psi]	1.7 [25]							
Maximum	bar [psi]	5.2 [75]							
<b>Speed limits</b>									
Rated @ max angle	min <sup>-1</sup> (rpm)	4000	3600	3300	4000	4000	3600	3300	4000
Maximum @ max angle	min <sup>-1</sup> (rpm)	5000	4500	4100	4100	5000	4500	4100	4100
Minimum	min <sup>-1</sup> (rpm)	500	500	500	500	500	500	500	500
<b>System pressure</b>									
Continuous	bar [psi]	210 [3000]							
Maximum	bar [psi]	345 [5000]							
Theoretical max flow at rated speed (per pump)	l/min [US gal/min]	100 [26.0]	126 [33.4]	145 [38.3]	184 [48.6]	100 [26.0]	126 [33.4]	145 [38.3]	184 [48.6]
<b>Inlet pressure</b>									
Continuous	bar absolute [in Hg vacuum]	0.8 [6.3]							
Maximum	bar absolute [in Hg vacuum]	0.7 [9.2]							

**FLUID SPECIFICATIONS**

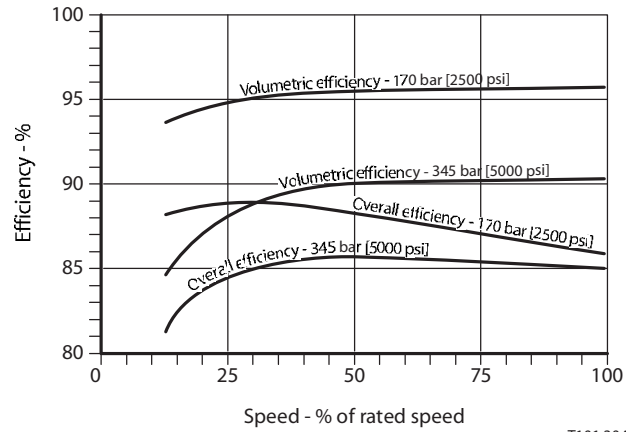
Ratings and data are based on operation with premium petroleum-based hydraulic fluids containing oxidation, rust, and foam inhibitors.

Parameter	Unit	Minimum	Continuous	Maximum
Viscosity	mm <sup>2</sup> /sec (cSt) [SUS]	7 [47]	12-60 [70-278]	1600 [7500]
Temperature	°C [°F]	-40 [-40]	82 [180]	104 [220]
Cleanliness		ISO 4406 Class 18/13 or better		
Filtration efficiency	suction filtration	$\beta_{25-44}=75$ ( $\beta_{10} \geq 1.5$ )		
	charge filtration	$\beta_{15-20}=75$ ( $\beta_{10} \geq 10$ )		

**PERFORMANCE**

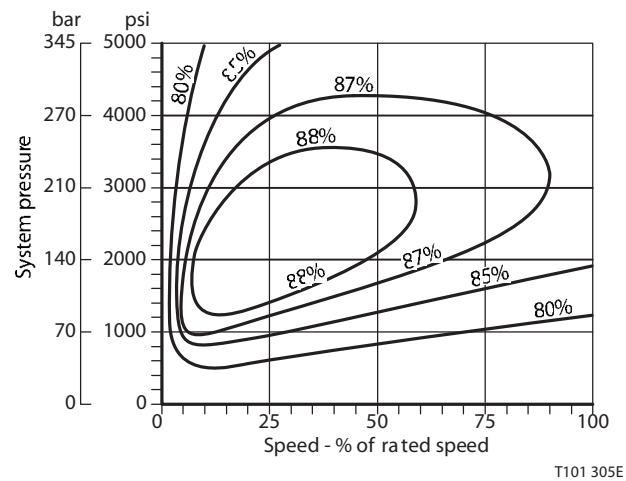
The following performance graph provides typical volumetric and overall efficiencies for Series 40 pumps. These efficiencies apply for all Series 40 pumps.

*Pump performance as a function of operating speed*



The performance map provides typical pump overall efficiencies at various operating parameters. These efficiencies also apply for all Series 40 pumps.

*Pump performance as a function of operating speed and system pressure*



**M25 VARIABLE PUMP**

Code	Description	Torque rating		Drawing
		Maximum torque rating N•m [lbf•in]	Continuous torque rating N•m [lbf•in]	
Y	Ø 22.20 mm [0.874 in] Straight keyed	140 [1240]	—	<p>P104 403E</p>
A	13-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	140 [1240]	85 [750]	<p>P104 404E</p>
C	Ø 25.4 mm [1.000 in] 1:8 taper (SAE J501)	140 [1240]	—	<p>P104 405E</p>

Other shaft options may exist. Contact your Sauer-Danfoss representative for availability and for specific installation drawings.

Dimensions in mm [in]

**M25 TANDEM PUMP**

Code	Description	Torque rating		Drawing
		Maximum torque rating N•m [lbf•in]	Continuous torque rating N•m [lbf•in]	
Y	Ø 22.20 mm [0.874 in] Straight keyed	140 [1240]	—	
A	13-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	140 [1240]	85 [750]	
C	Ø 25.4 mm [1.000 in] 1:8 taper (SAE J501)	140 [1240]	—	

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Dimensions in mm [in]

**M35/44 VARIABLE PUMP**

Code	Description	Torque rating		Drawing																			
		Maximum torque rating N•m [lbf•in]	Continuous torque rating N•m [lbf•in]																				
Y	Ø 22.20 mm [0.874 in] Straight keyed	226 [2000]	—	<p>P104 409E</p>																			
A	13-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	126 [2000]	124 [1100]	<p>P104 410E</p>																			
G	15-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	362 [3200]	153 [1350]	<p>P104 410E</p>																			
		<table border="1"> <thead> <tr> <th>Shaft option</th> <th>Shaft dia.</th> <th>Full spline</th> <th>Major dia.</th> <th>Pitch dia.</th> <th>No. teeth</th> </tr> </thead> <tbody> <tr> <td>G</td> <td>21.97 [0.865]</td> <td>18.5 [0.73]</td> <td>24.89 [0.9800]</td> <td>23.812 [0.9375]</td> <td>15</td> </tr> <tr> <td>A</td> <td>18.8 [0.74]</td> <td>16.50.65</td> <td>21.72 [0.855]</td> <td>20.638 [0.8125]</td> <td>13</td> </tr> </tbody> </table>				Shaft option	Shaft dia.	Full spline	Major dia.	Pitch dia.	No. teeth	G	21.97 [0.865]	18.5 [0.73]	24.89 [0.9800]	23.812 [0.9375]	15	A	18.8 [0.74]	16.50.65	21.72 [0.855]	20.638 [0.8125]	13
Shaft option	Shaft dia.	Full spline	Major dia.	Pitch dia.	No. teeth																		
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A	18.8 [0.74]	16.50.65	21.72 [0.855]	20.638 [0.8125]	13																		
N	Ø 25.4 mm [1.000 in] 1:8 taper (SAE J501)	497 [4400]	—	<p>P104 411E</p>																			

Other shaft options may exist. Contact your Sauer-Danfoss representative for availability and for specific installation drawings.

Dimensions in mm [in]

**M35/44 TANDEM PUMP**

Code	Description	Torque rating		Drawing																							
		Maximum torque rating N•m [lbf•in]	Continuous torque rating N•m [lbf•in]																								
Y	Ø 22.20 mm [0.874 in] Straight keyed	226 [2000]	—	<p>P104 409E</p>																							
A	15-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	362 [3200]	153 [1350]	<p>P104 418E</p>																							
G	15-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	362 [3200]	153 [1350]	<p>P104 418E</p>																							
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Shaft option	Shaft dia.	Full spline	Major dia.	Pitch dia.		No. teeth																					
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A	21.97 [0.865]	18.5 [0.73]	24.89 [0.9800]	23.812 [0.9375]	15																						
N	Ø 25.4 mm [1.000 in] 1:8 taper (SAE J501)	497 [4400]	—	<p>P104 405E</p>																							

Other shaft options may exist. Contact your Sauer-Danfoss representative for availability and for specific installation drawings.

Dimensions in mm [in]

**M46 VARIABLE PUMP**

Code	Description	Torque rating		Drawing
		Maximum torque rating N•m [lbf•in]	Continuous torque rating N•m [lbf•in]	
V W	Ø 25.37 mm [0.999 in] Straight keyed	<b>362 [3200]</b>	—	<p>6.35 [0.250] Sq key  44.4 [1.75] long  0.38 [0.015] min R on edges  2.85 [0.112] max  25.4 [1.00] dia  7.4 [0.29]  69.6 [2.74]  Mounting flange (ref.)  Coupling must not protrude beyond this surface  P104 415E</p>
N P R S	Ø 25.4 mm [1.000 in] 1:8 taper (SAE J501)	<b>497 [4400]</b>	—	<p>42.4 [1.67]  6.35 [0.250] Sq. key  19.05 [0.75] long  0.38 [0.015] min. R on edges  3/4-16 UNF-2B thd.  2.84 [0.112] max.  22.2 [0.875] gauge dia.  26.9 [1.06] Hex nut (option) torque nut to 149 to 190 Nm [110 to 140 Lbf.ft.] Thds to be cleaned and lubricated  1.50 taper per foot SAE standard J501  26.9 [1.06] 25.4 [1.000] nominal shaft dia.  12.7 [0.50]  33.3 [1.311] Gauge Dim.  Mounting flange (ref.)  Coupling must not protrude beyond 36.3 [1.44] max.  P104 417E</p>

Other shaft options may exist. Contact your Sauer-Danfoss representative for availability and for specific installation drawings.

Dimensions in mm [in]

**M46 VARIABLE PUMP**

Code	Description	Torque rating		Drawing
		Maximum torque rating N·m [lbf·in]	Continuous torque rating N·m [lbf·in]	
G H J	13-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	226 [2000]	124 [1100]	<p>7.4 [0.29]</p> <p>Coupling must not protrude beyond this surface</p> <p>Mounting flange (ref.)</p> <p>W pitch dia          Y teeth, 16/32 pitch          30° pressure angle          fillet root side fit          per ANSI B92.1-1970          class 5          also mates with          flat root side fit</p> <p>P104 416E</p>
K A B D E X Z	15-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	362 [3200]	153 [1350]	

Shaft option	Length	Shaft dia.	Full spline	Major dia.	Pitch dia.	No. teeth
	S	T	U	V	W	Y
G, H, J & K	37.7 [1.485]	22.3 [0.88]	23.4 [0.92]	24.89 [0.9800]	23.81 [0.9375]	15
A, B & D	32.9 [1.297]	20.3 [0.80]	16.26 [0.64]	21.72 [0.8550]	20.64 [0.8125]	13
E, & X,	54.74 [2.155]	22.3 [0.88]	39.88 [1.57]	24.89 [0.9800]	23.81 [0.9375]	15
Z	51.82 [2.040]	22.3 [0.88]	36.83 [1.45]	24.89 [0.9800]	23.81 [0.9375]	15

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Dimensions in mm [in]

**M46 TANDEM PUMP**

Code	Description	Torque rating		Drawing
		Maximum torque rating N•m [lbf•in]	Continuous torque rating N•m [lbf•in]	
J	Ø 25.37 mm [0.999 in] Straight keyed	<b>362 [3200]</b>	—	<p>P104 412E</p>
C	Ø 25.4 mm [1.000 in] 1:8 taper (SAE J501)	<b>497 [4400]</b>		<p>P104 414E</p>

Other shaft options may exist. Contact your Sauer-Danfoss representative for availability and for specific installation drawings.

Dimensions in mm [in]

**M46 TANDEM PUMP**

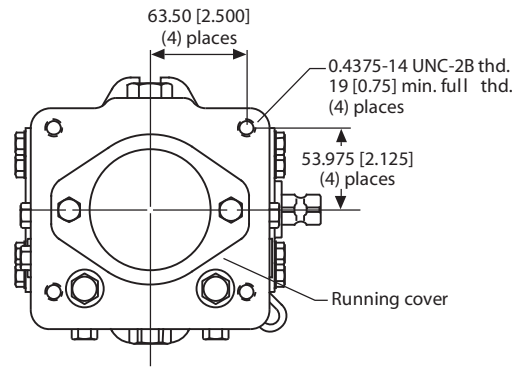
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T	Ø 25.4 mm [1.000 in] 1:8 taper (SAE J501)	497 [4400]	—																													
A	15-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	362 [3200]	153 [1350]																													
B	19-tooth 16/32 pitch (ANSI B92.1 1970 - Class 5)	734 [3500]	305 [2700]																													
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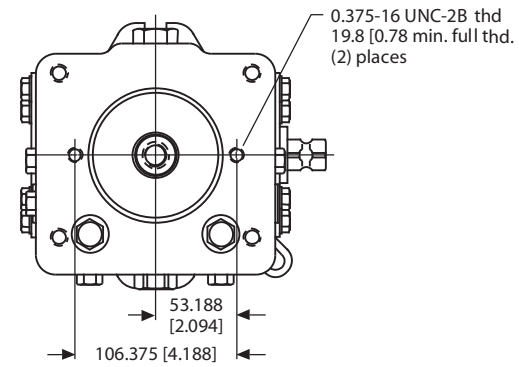
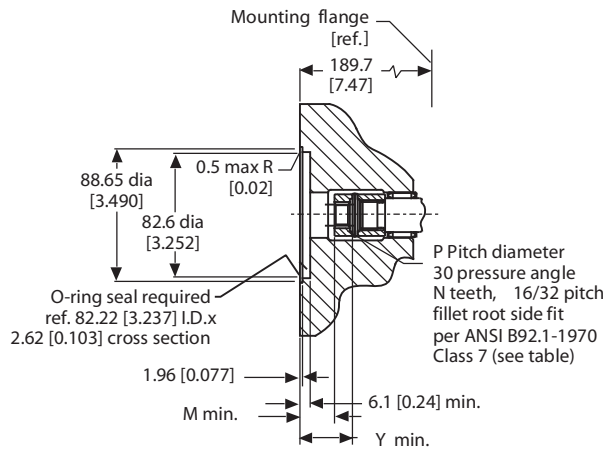
Dimensions in mm [in]

**M25 VARIABLE PUMP  
 DIMENSIONS**

*Auxiliary mounting flange*



Running cover



SAE A Auxiliary mounting flange

P100 603E

*M25PV Auxiliary flange coupling options*

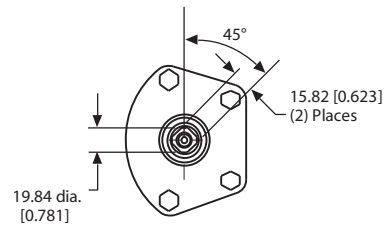
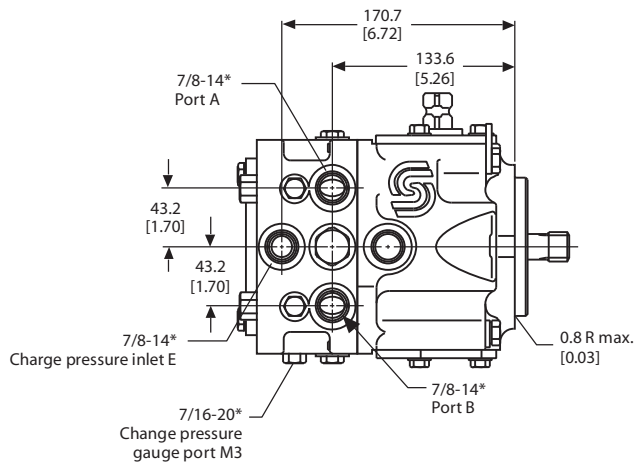
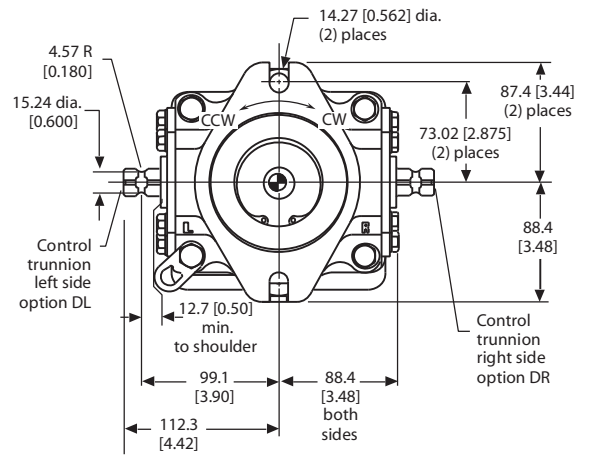
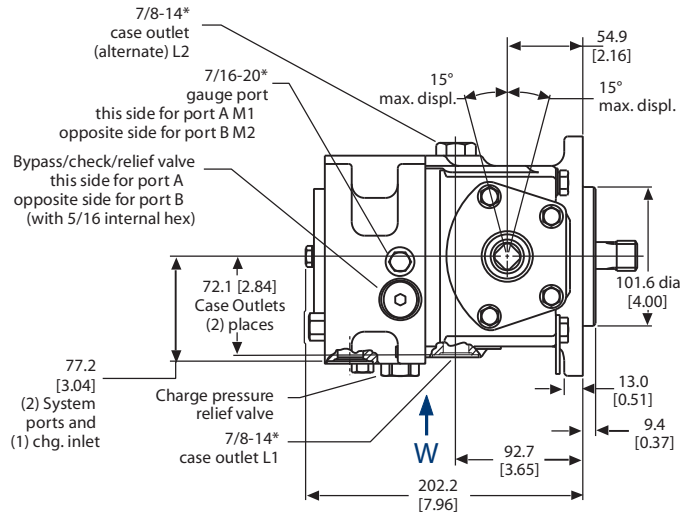
Auxiliary mounting flange		Spline pitch dia. P	Number of teeth N	Shaft clearance Y	Coupling clearance M
SAE A	Option A	14.30 [0.563]	9	34.5 [1.36]	22.6 [0.89]
SAE A	Option D	17.46 [0.688]	11	39.6 [1.56]	25.9 [1.02]

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
 Shaft rotation is determined by viewing pump from input shaft end.  
 Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]

**M25 VARIABLE PUMP  
 DIMENSIONS  
 (continued)**

*Pump and control*



Control trunion detail

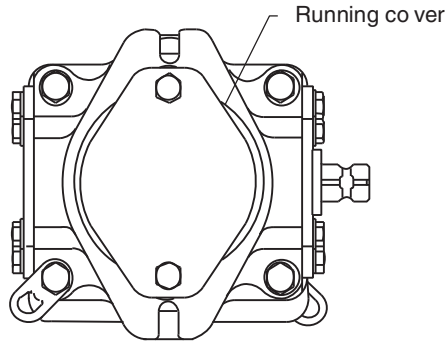
P100 602E

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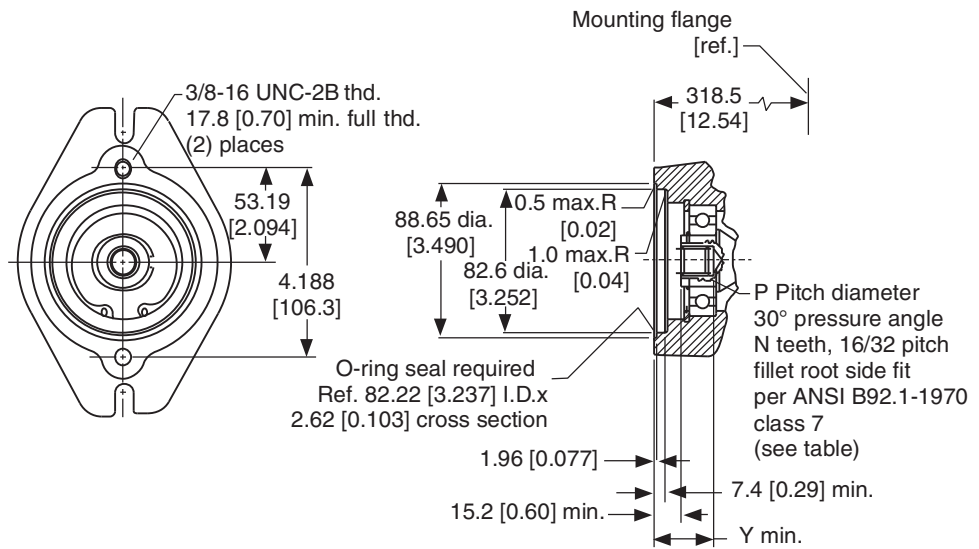
Dimensions in mm [in]

**M25 TANDEM PUMP  
 DIMENSIONS**

*Auxiliary mounting flange*



Running cover



SAE A Auxiliary mounting flange

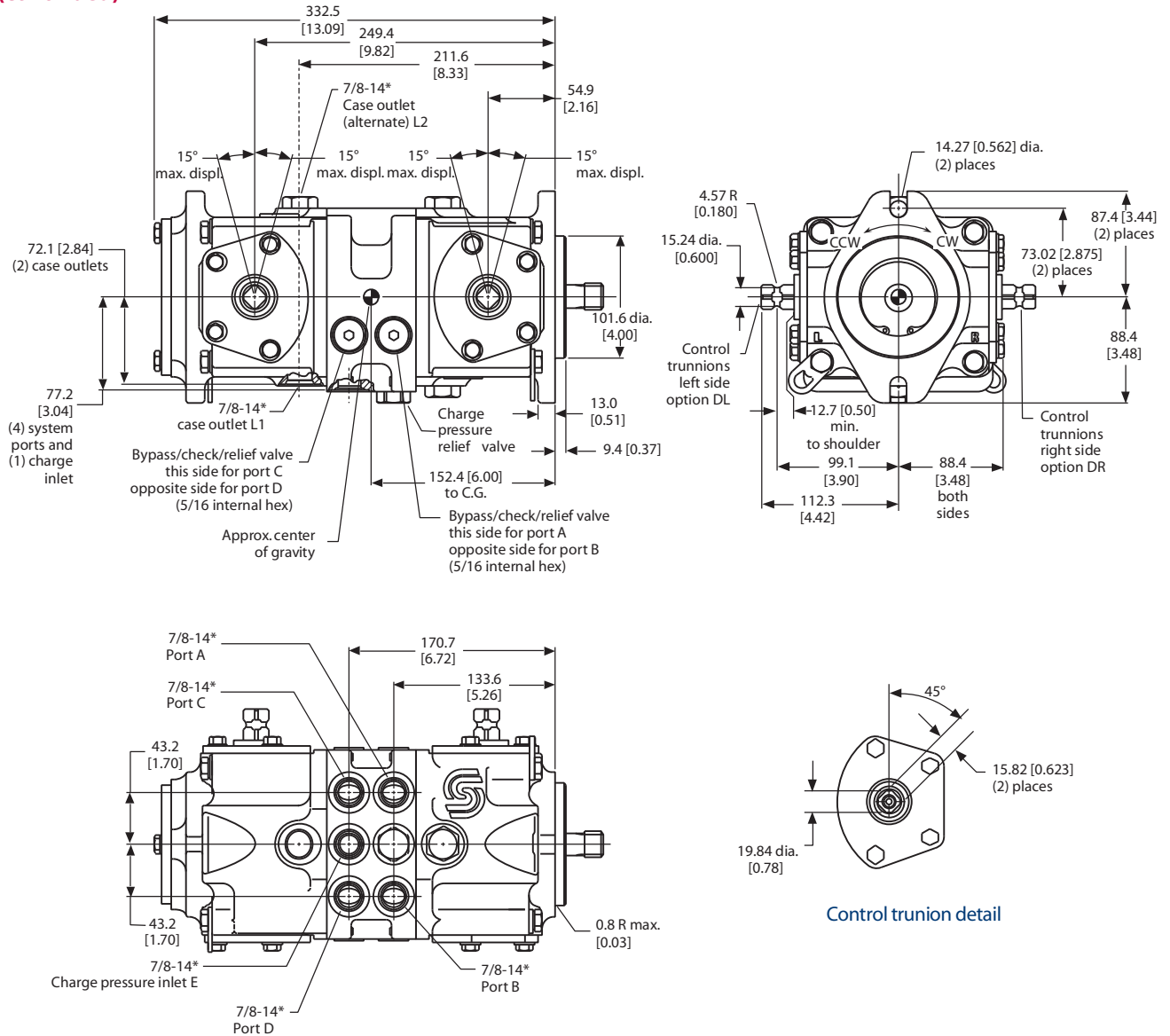
P100 612E

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Dimensions in mm [in]

**M25 TANDEM PUMP  
DIMENSIONS  
(continued)**

*Pump and control*



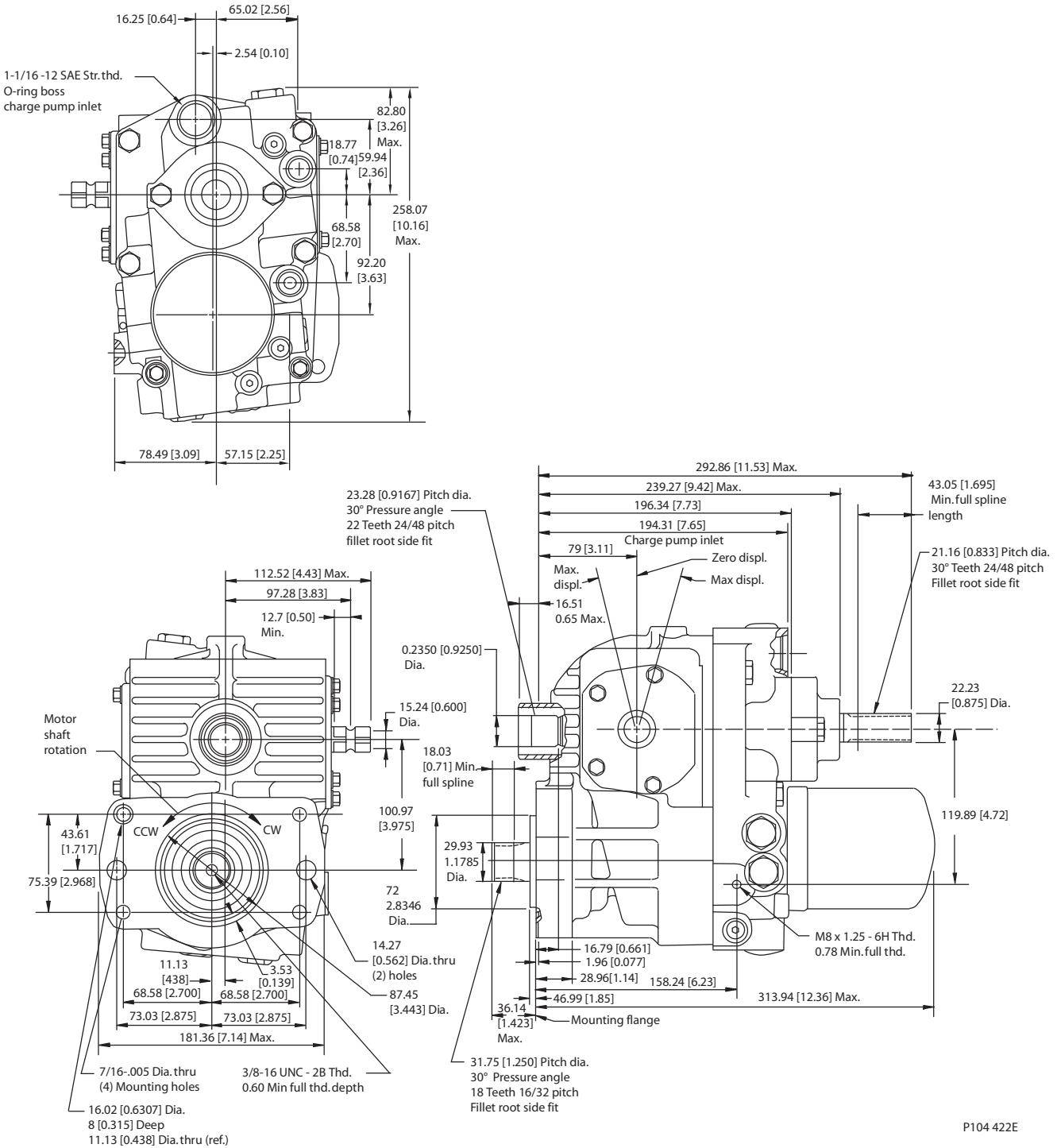
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Dimensions in mm [in]

**M25 U DIMENSIONS**

*Transmission*



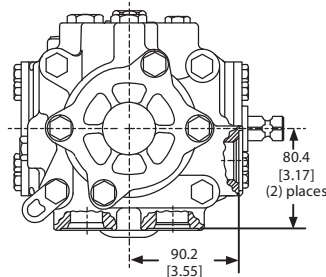
P104 422E

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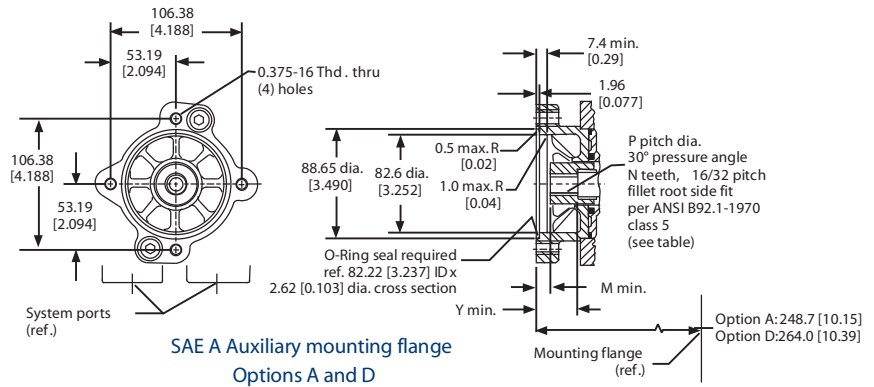
Dimensions in mm [in]

**M35/44 VARIABLE PUMP  
 DIMENSIONS**

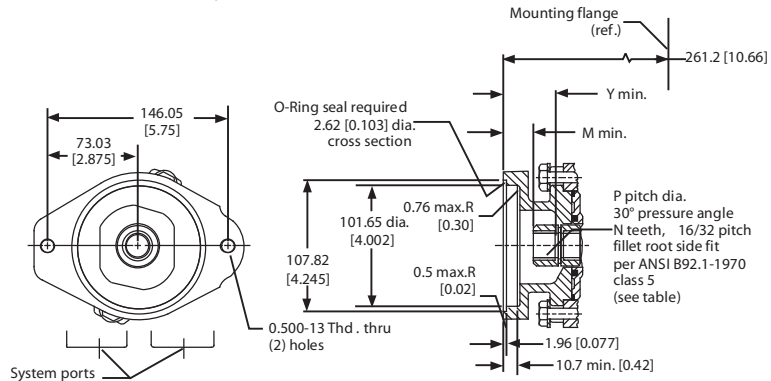
*Auxiliary mounting flange*



RUNNING COVER



SAE A Auxiliary mounting flange  
 Options A and D



SAE B Auxiliary mounting flange  
 Option B

P100 615E

*M35/44 PV Auxiliary mounting flange and coupling option*

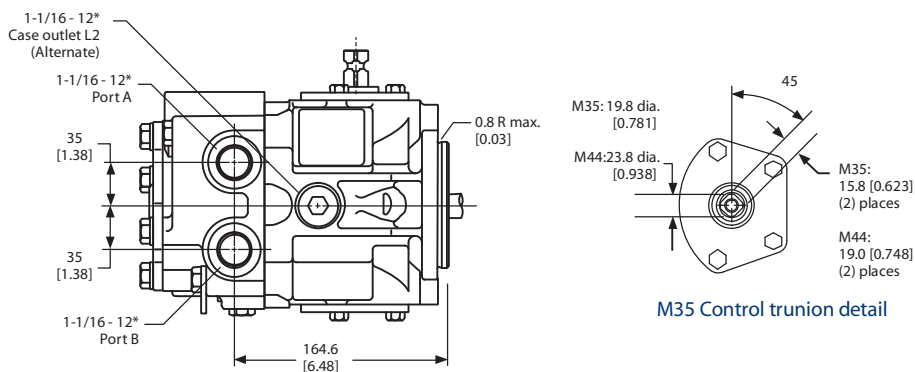
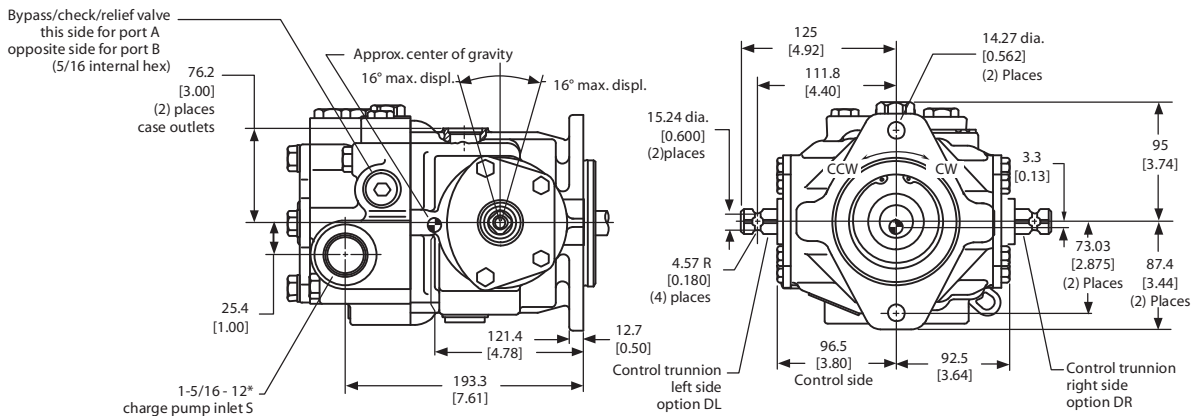
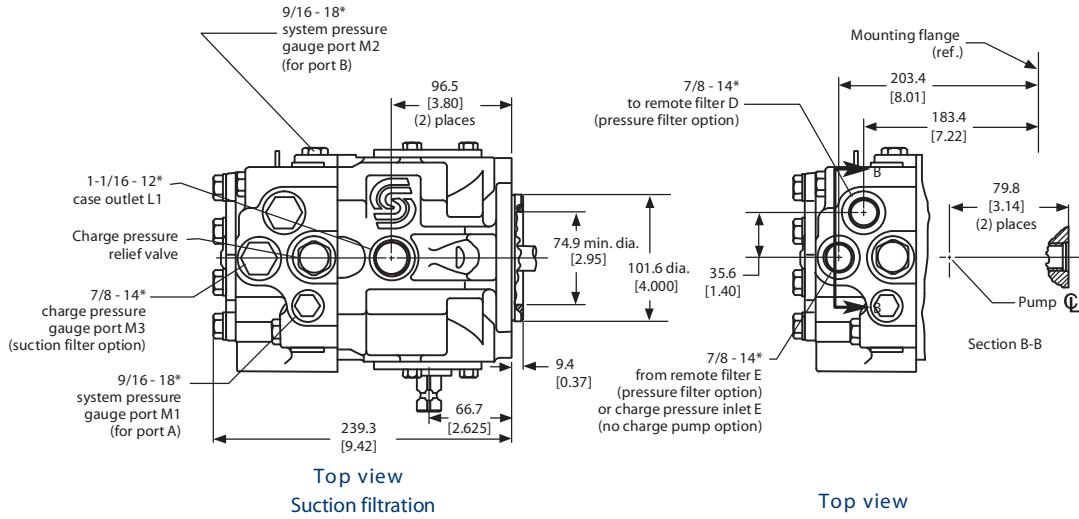
Auxiliary mounting flange		Spline pitch dia. P	No. teeth N	Shaft clearance Y	Coupling clearance M
SAE A	Option A	14.30 [0.563]	9	33.0 [1.30]	9.1 [0.36]
SAE A	Option D	17.46 [0.688]	11	39.1 [1.54]	9.1 [0.36]
SAE B	Option B	20.72 [0.813]	13	42.9 [1.69]	22.3 [0.91]

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
 Shaft rotation is determined by viewing pump from input shaft end.  
 Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]

**M35/44 VARIABLE PUMP**  
**DIMENSIONS**  
**(continued)**

*Pump, filtration/charge pump option, control*



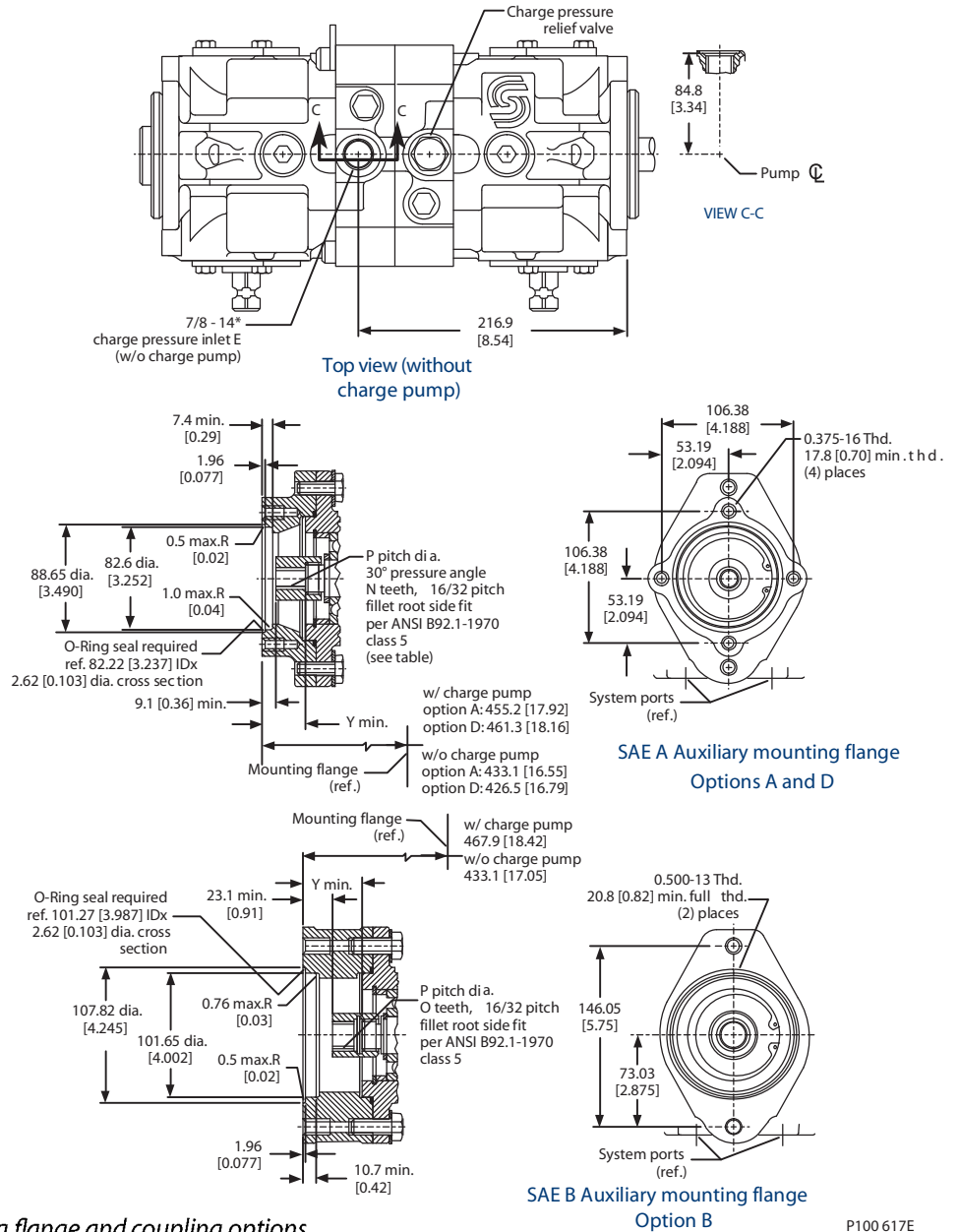
P104 614E

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
Shaft rotation is determined by viewing pump from input shaft end.  
Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]

**M35/44 TANDEM PUMP  
 DIMENSIONS**

*Charge pump options, auxiliary mounting flanges*



*M35/44 PT Auxiliary mounting flange and coupling options*

P100 617E

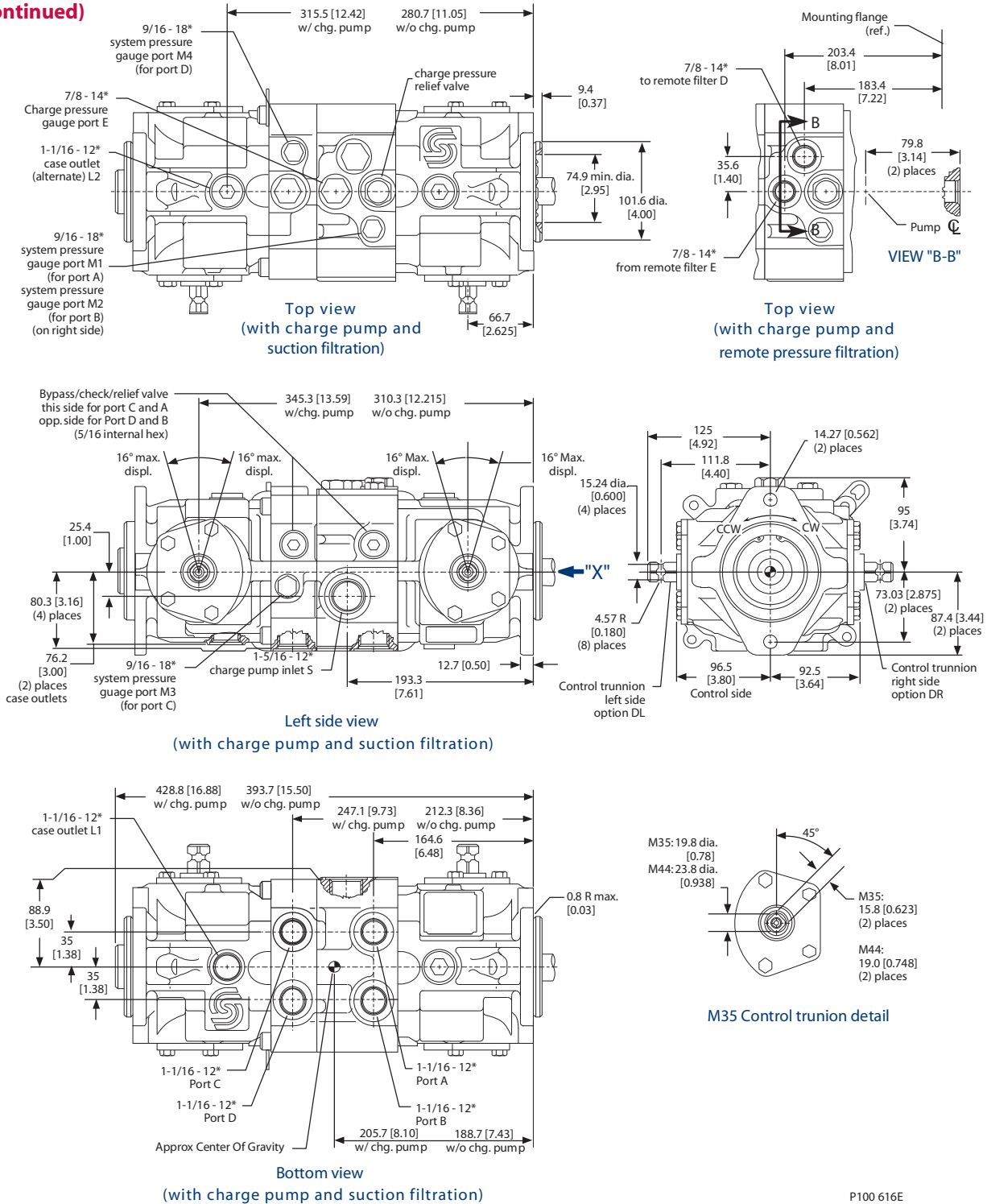
Auxiliary mounting flange		Spline pitch dia. P	No. teeth N	Shaft clearance Y	Coupling clearance M
SAE A	Option A	14.30 [.563]	9	33.0 [1.30]	9.1 [0.36]
SAE A	Option D	17.46 [.688]	11	39.1 [1.54]	9.1 [.36]
SAE B	Option B	20.72 [0.813]	13	42.9 [1.69]	22.3 [0.91]

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
 Shaft rotation is determined by viewing pump from input shaft end.  
 Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]

**M35/44 TANDEM PUMP  
 DIMENSIONS  
 (continued)**

*Pumps, filtration/charge pump options, control*



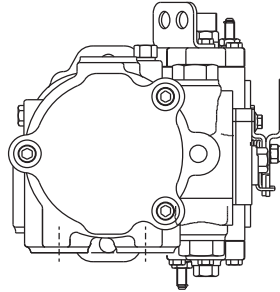
P100 616E

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
 Shaft rotation is determined by viewing pump from input shaft end.  
 Contact your SAUER-DANFOSS representative for specific installation drawings.

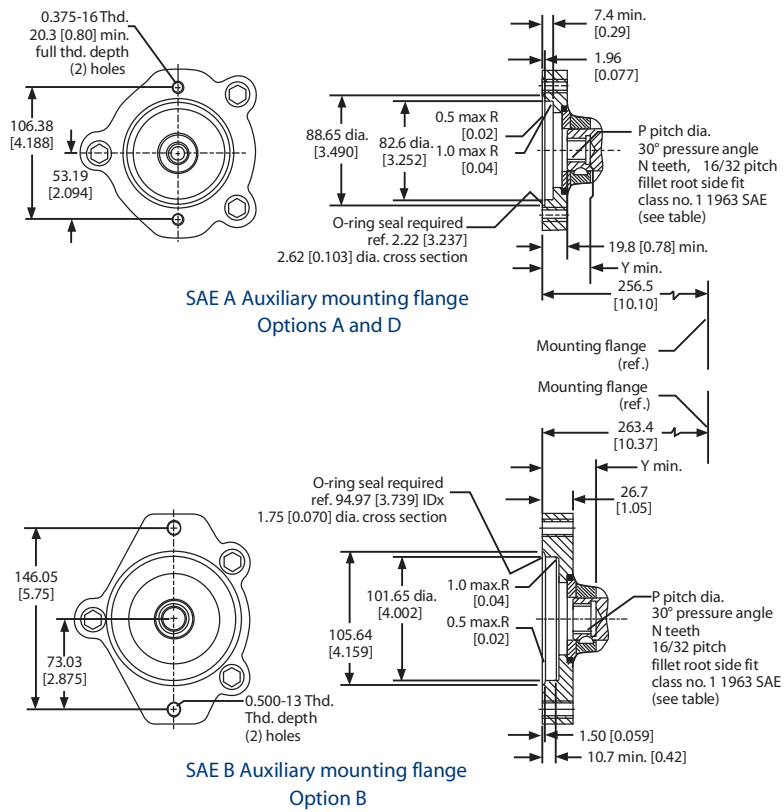
Dimensions in mm [in]

**M46 VARIABLE PUMP  
 DIMENSIONS**

*Auxiliary mounting flanges*



Rear view (no pads shown)



P100 619E

*M46 PV auxiliary mounting flange and coupling options*

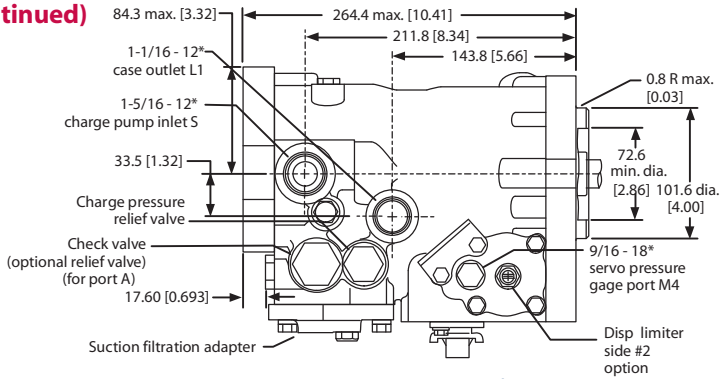
Auxiliary mounting flange	Spline pitch dia. P	Number of teeth N	Minimum clearance Y
SAE A Option A	14.30 [0.563]	9	36.6 [1.44]
SAE A Option D	17.46 [0.688]	11	42.4 [1.67]
SAE B Option B	20.72 [0.813]	13	46.0 [1.81]

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
 Shaft rotation is determined by viewing pump from input shaft end.  
 Contact your SAUER-DANFOSS representative for specific installation drawings.

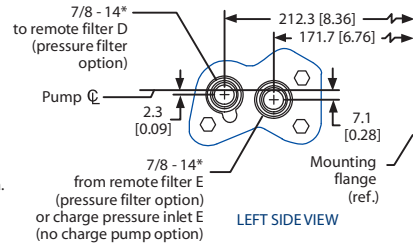
Dimensions in mm [in]

**M46 VARIABLE PUMP  
 DIMENSIONS  
 (continued)**

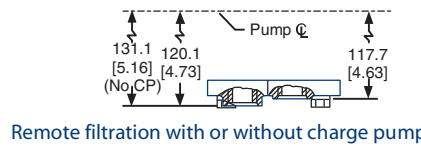
*Pump, filtration/charge pump options, MDC, displacement limiter*



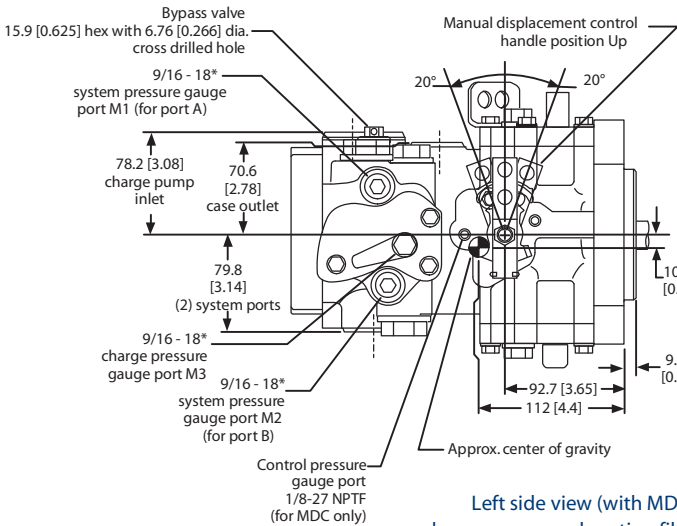
Top view (with MDC, charge pump, and suction filtration)



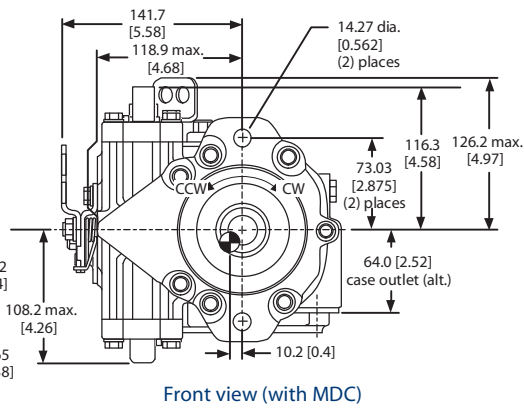
LEFT SIDE VIEW



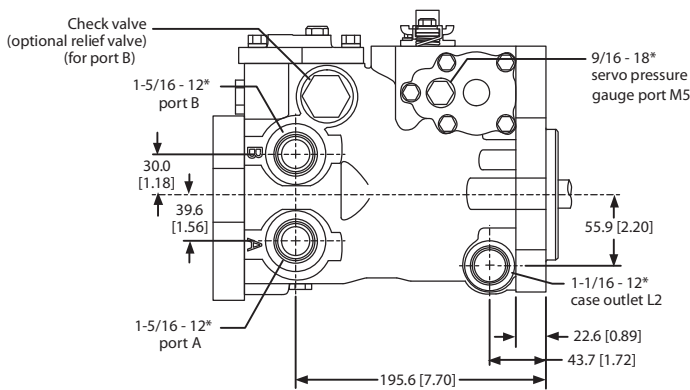
Remote filtration with or without charge pump



Left side view (with MDC, charge pump, and suction filtration)



Front view (with MDC)



Bottom view (with MDC and suction filtration)

P100 618E

*M46 PV adjustable displacement limiter (option)*

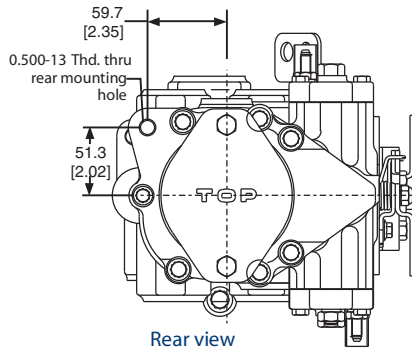
Shaft rotation	CW	CCW
Displacement limiter side	2	2
Limits flow out of port	B	A

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
 Shaft rotation is determined by viewing pump from input shaft end.  
 Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]

**M46 TANDEM PUMP  
 DIMENSIONS**

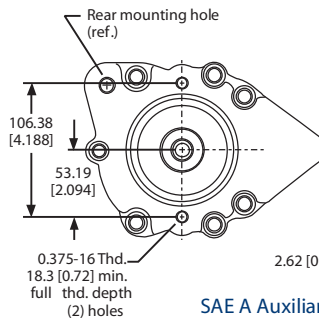
Auxiliary mounting flange



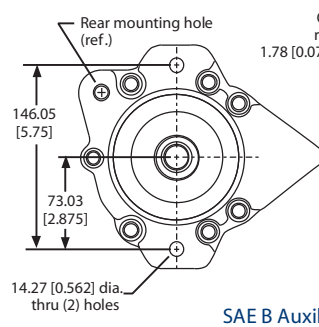
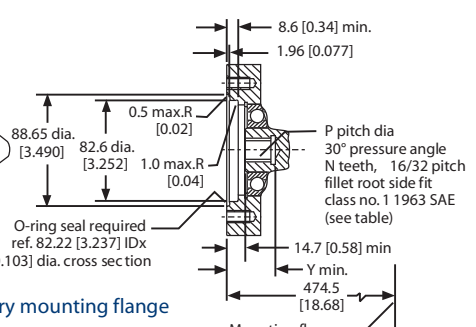
Rear view  
 no auxiliary mounting flange

M46 PT auxiliary mounting flange and coupling options

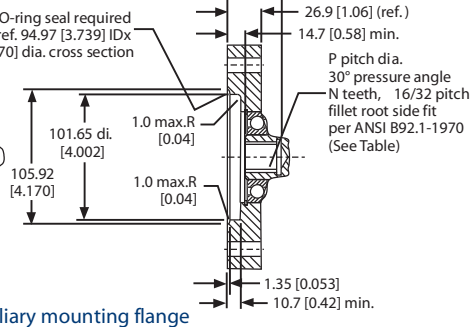
Auxiliary mounting flange	Spline pitch dia. P	Number of teeth N	Minimum clearance Y
SAE A Option A	14.30 [0.563]	9	35.6 [1.40]
SAE A Option D	17.46 [0.688]	11	38.1 [1.50]
SAE B Option B	20.72 [0.813]	13	47.5 [1.87]



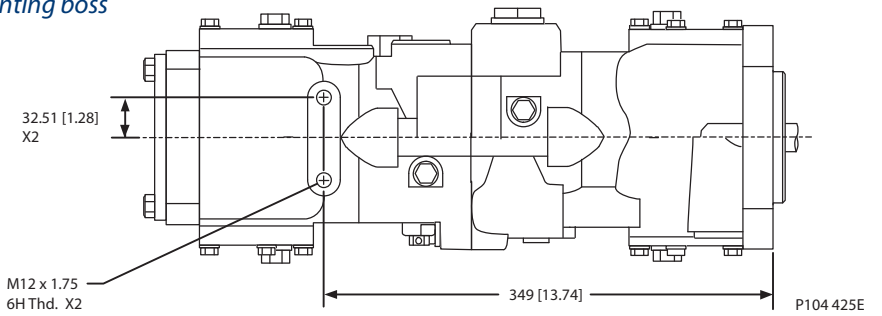
SAE A Auxiliary mounting flange options A and D



SAE B Auxiliary mounting flange Option B



Rear mounting boss



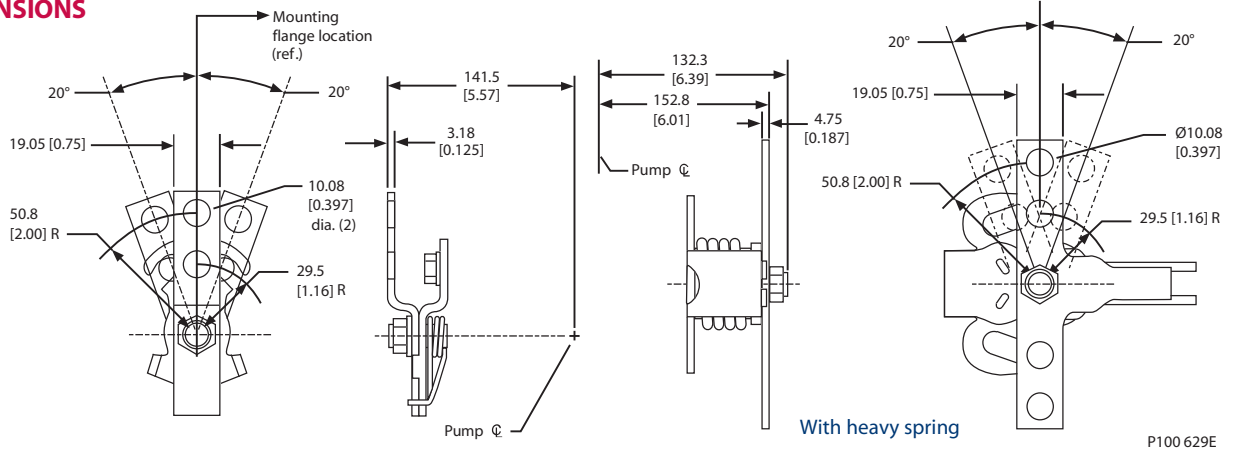
\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
 Shaft rotation is determined by viewing pump from input shaft end.  
 Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]



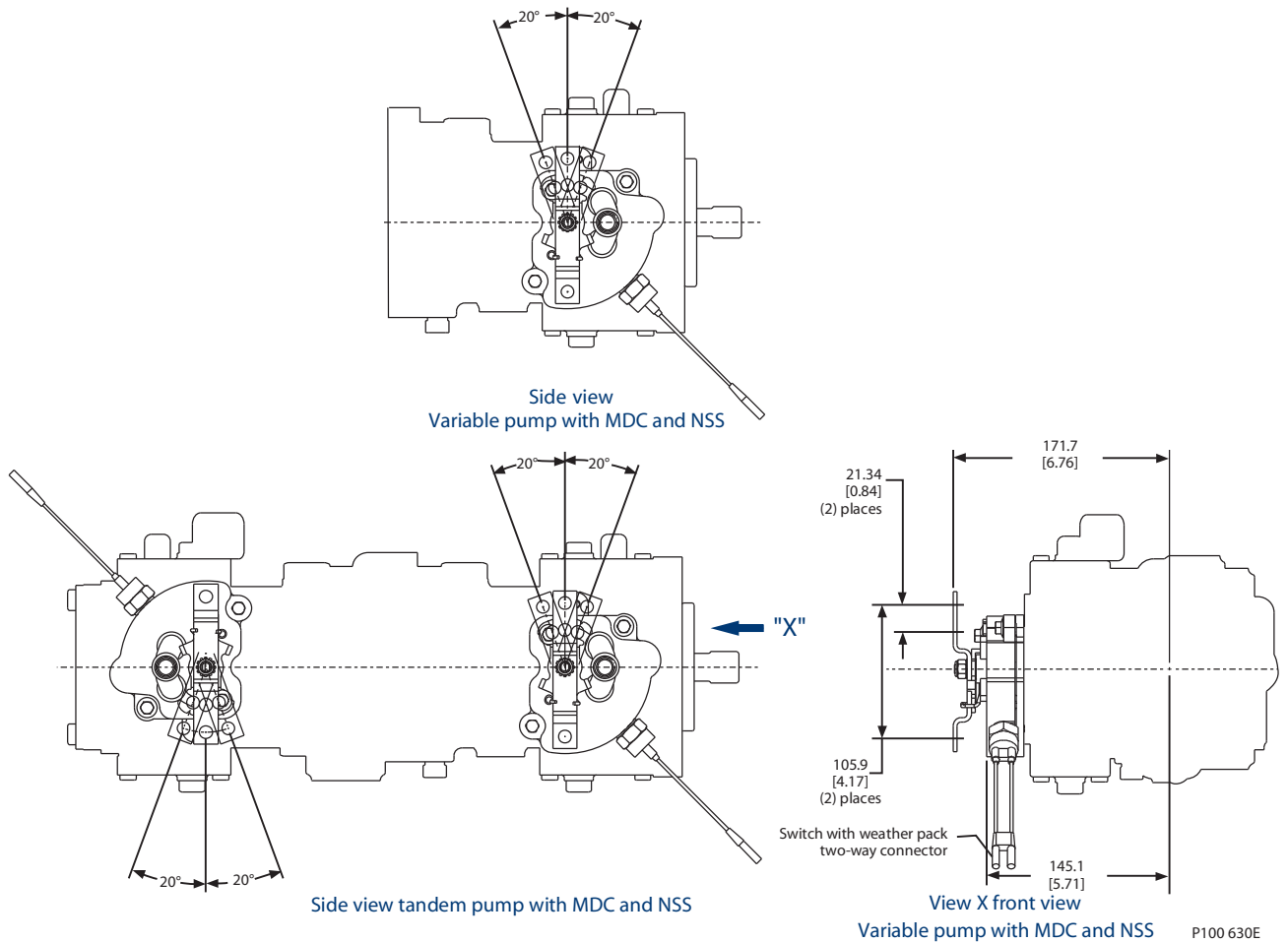
**M46 CONTROL MODULE  
 DIMENSIONS**

*M46 PV/PT manual displacement control handle*



P100 629E

*M46 PV/PT manual displacement control with neutral start switch*



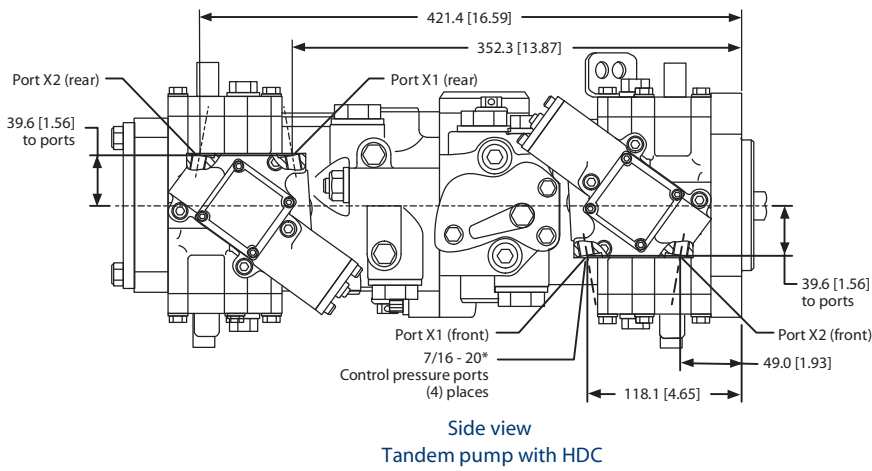
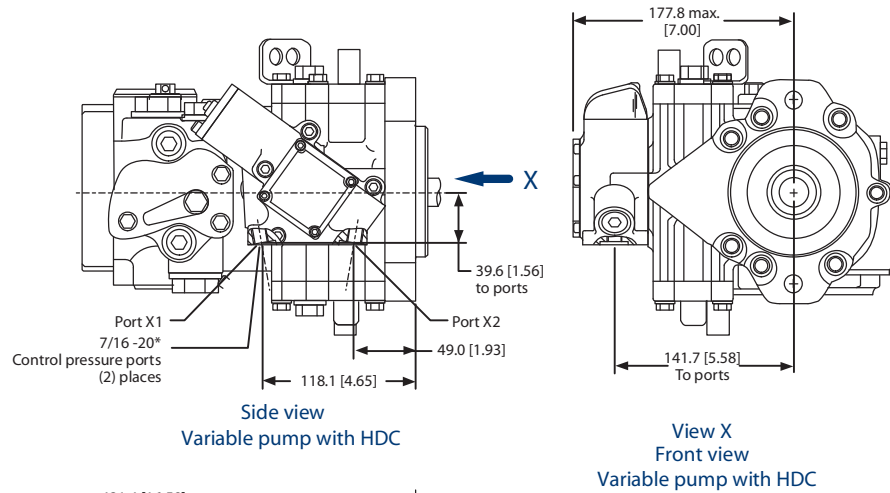
P100 630E

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
 Shaft rotation is determined by viewing pump from input shaft end.  
 Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]

**M46 CONTROL MODULE  
DIMENSIONS  
(continued)**

*M46 PV/PT hydraulic displacement control*

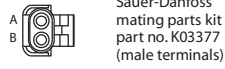


P100631E

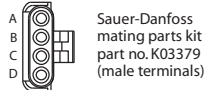
\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
Shaft rotation is determined by viewing pump from input shaft end.  
Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]

**M46 CONTROL MODULE**    *M46 PV/PT electronic displacement control*  
**DIMENSIONS**  
**(continued)**



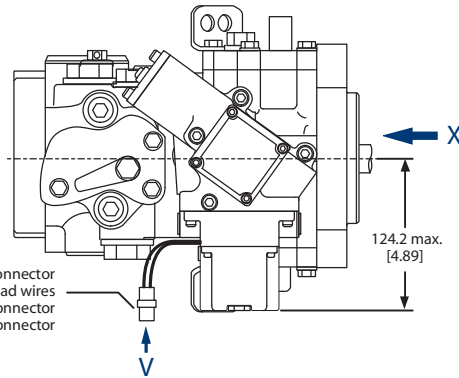
Packard Weather-Pack  
 2-way tower connector (female terminals)



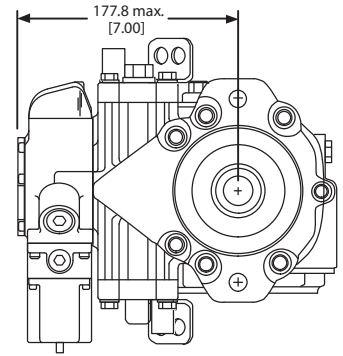
Packard Weather-Pack  
 4-way tower connector (female terminals)

View V

Packard "Weather Pack" shroud connector  
 on 76 mm [3 in] lead wires  
 2-way (single coil PCP) mates with Packard 12015792 connector  
 4-way (Dual Coil PCP) mates with Packard 12015797 connector

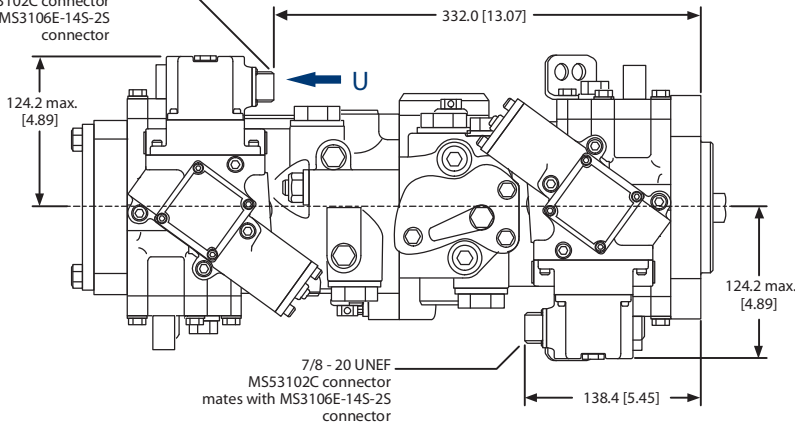


Side view  
 Variable pump with EDC  
 (Packard Weather-Pack connector)

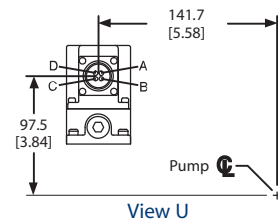


View X  
 Front view  
 Variable pump with EDC  
 (Packard Weather-Pack connector)

7/8 - 20 UNEF  
 MS53102C connector  
 mates with MS3106E-14S-2S  
 connector



Side view  
 Tandem pump with EDC  
 (MS connector)



View U

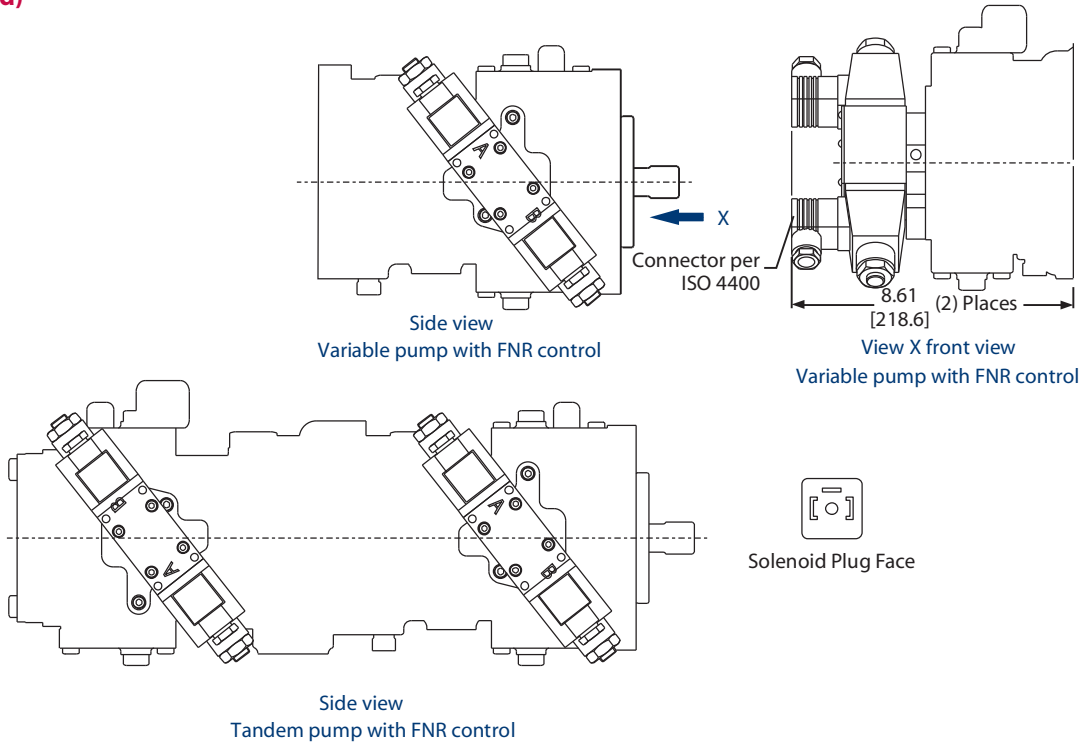
P100 632E

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
 Shaft rotation is determined by viewing pump from input shaft end.  
 Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]

**M46 CONTROL MODULE  
DIMENSIONS  
(continued)**

*M46 PV/PT three-position electric displacement control (FNR)*



P100 635E

\*All ports are SAE straight thread o-ring ports per SAE J514, unless otherwise specified.  
Shaft rotation is determined by viewing pump from input shaft end.  
Contact your SAUER-DANFOSS representative for specific installation drawings.

Dimensions in mm [in]