

Hydrokraft Open Loop Piston Pumps X Series



Contents

Introduction

Description	3
Typical Section	3

Model Codes

Basic Pumps	4
DF Control	6
LR Control	7
ST Control	8
FM Control	9
ZP Control	10
SP Control	11
ES Control	12
NO Control	13
Combination pump units	14

Pump Specifications

Metric	15
US	16

Performance Curves

066 & 090 Series	17
130 & 180 Series	18
250 Series	19

Installation and Start-up

Application Data and Fluid Recommendations

Pump Dimensions

Variable Displacements

PVXS-066	22
PVXS-090	24
PVXS-130	26
PVXS-180	28
PVXS-250	30

Control Options

DF Control	32
A0	33
A10	34
A0F	35
A0S	36
AA	37
AB	38
A0	39

LR Control

A20 - size 066-180	41
A20 - size 250	42
A2F - size 066-180	43
A2F - size 250	44
A30 - size 066-180	45
A30 - size 250	46

ST Control

STC03A00	48
STC03A40	49
STC03A4F	50
STC03A4K	51
STC03A4K___C	52
STC03A4B	53
STC03A4B	54
STC03A50	55
STC03A5F	56
STC03A5K	57
STC03A5L	58
FM Control	59
FM000A0	60
ZP Control	61
ZP100A0	62
SP Control	63
SPC03A	64
ES Control	65
ESON00A00	66

General Dimensions

Fixed Displacement

PFXS-066	67
PFXS-090	68
PFXS- 130	69
PFXS - 180	70

Thru-Drive Options

066-090	71
130-180	72
250	73

Introduction

- Axial piston pumps with swashplate design for reliable operation and long life.
- Pressure up to 420 bar. Rated speed up to 1800 min⁻¹. Higher speeds possible on request.
- Oversize shafts and bearings.
- Rotating and pressure-loaded parts are pressure balanced.
- Integrated pilot pump, filter and pressure relief valves available.
- "Building block" design gives these pumps a wide range of application.

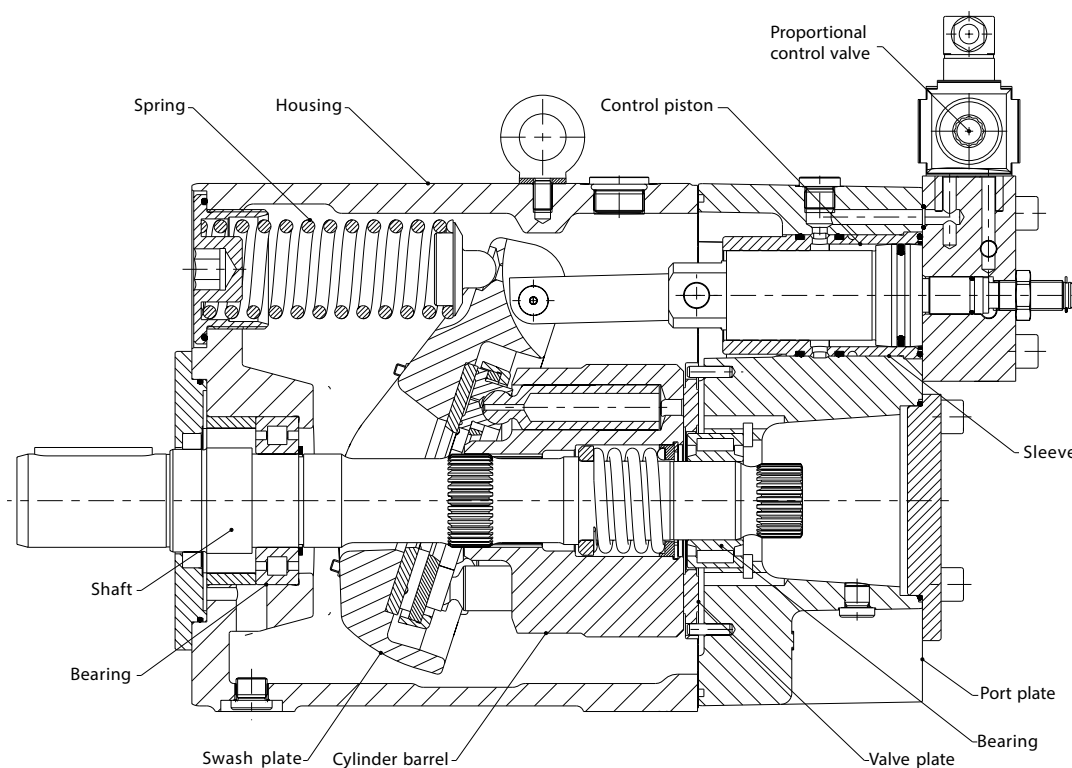
Available displacement sizes

66 ccm/rev
90 ccm/rev
130 ccm/rev
180 ccm/rev
250 ccm/rev

Displacement controls

- DF** - Pressure compensator
- LR** - Power limiter control
- ST** - Electronic flow control
- FM** - Screw adjustment flow control
- ZP** - Dual displacement control
- SP** - Electronic flow control
- ES** - Electric motor flow control

Typical Section of Open Loop PVX Pump



Note

Dimensional data provided in this catalog is subject to change without notice.

Model code

Open Loop Pumps
X Series - Basic Pumps

- Preferred standard option
- Other standard option
- Special option on request
- X Not available

P V X * - * * * M * * * * * * 1 * * * S * * A

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Pump Size		66	90	130	180	250
1	Pump					
P	– Open loop pump	●	●	●	●	●
2	Displacement					
V	– Variable	●	●	●	●	●
F	– Fixed	●	●	●	●	X
3	Pump Series					
X	– “X” series	●	●	●	●	●
4	Configuration					
S	– Single unit	●	●	●	●	●
F	– Front unit	○	○	○	○	○
M	– Middle unit	○	○	○	○	○
R	– Rear unit	○	○	○	○	○
5	Separator	●	●	●	●	●
6 7 8	Displacement cm³/rev (in³/rev)					
066	– 066 cm ³ /rev (4 in ³ /rev) ▲	●	X	X	X	X
090	– 090 cm ³ /rev (5.5 in ³ /rev)	X	●	X	X	X
130	– 130 cm ³ /rev (8 in ³ /rev)	X	X	●	X	X
180	– 180 cm ³ /rev (11 in ³ /rev)	X	X	X	●	X
250	– 250 cm ³ /rev (15.3 in ³ /rev)	X	X	X	X	●
***	– Non-standard(PFX only) ◇	○	○	○	○	X
◇ Non-standard displacements (cm ³ /rev):						
066	– 44/50					
090	– 75					
130	– 94/112					
180	– 160					
9	Basic Standard					
M	– Metric	●	●	●	●	●
10 11	Mounting Flange					
02	– ISO 3019/2-125A2SW	●	●	X	X	X
04	– ISO 3019/2-160A2SW	X	X	●	●	X
06	– ISO 3019/2 200A2SW	X	X	X	X	●
12	Rotation Direction					
R	– Clockwise	●	●	●	●	X
L	– Counter-clockwise	○	○	○	○	X
13	Maximum displacement					
0	– Max. displacement adjusting screw					
	With control DF/ZP	●	●	●	●	●
	With control ST +DF	●	●	●	●	●
	With control ST +LR	X	X	X	X	X
	With control LR/SP/FM/ES	X	X	X	X	X
4	– Fixed mechanical stop ring side A (max displacement)	○	○	○	○	○
5	– Fixed mechanical stop ring side B (min. displacement)	○	○	○	○	○
Pump Size		66	90	130	180	250

Pump Size		66	90	130	180	250
14 15	Thru drive options					
00	– None	●	●	●	●	●
0A	– SAE A	○	○	○	○	○
0B	– SAE B	○	○	○	○	○
0C	– SAE C	○	○	○	○	○
0P	– Pilot pump(8cm ³ /rev)	○	○	○	○	○
0X	– For tandem units	○	○	○	○	○
16	Main Ports					
1	– SAE ports - Metric bolts	●	●	●	●	●
17	Main port orientation					
R	– Radial (side ports)	●	●	●	●	●
A	– Axial (in-line rear)	○	○	○	○	○
▼ For fixed units only radial ports available						
18 19	Main drive shaft end					
01	– ISO straight key	●	●	●	●	●
02	– ISO spline	○	○	○	○	○
20	Drive shaft seal configuration					
S	– Single shaft seal	●	●	●	●	●
21	Seal material					
V	– FKM	●	●	●	●	●
F	– FKM + front bearing flushing prepared	○	○	○	○	○
K	– FKM with HP lubrication	○	○	○	○	○
L	– For HFC Hp-Lub + front flushing	○	○	○	○	○
M	– For HFC Hp-Lub + front + rear flushing	○	○	○	○	○
G	– For HFC front + rear flushing	○	○	○	○	○
A	– EPDM / PTFE	○	○	○	○	○
22	Yoke position indicator					
0	– No position indicator	●	●	●	●	●
V	– Visual indicator	○	○	○	○	○
P	– Voltage indicator ▲	○	○	○	○	○
M	– Voltage + visual indicator ▲	○	○	○	○	○
L	– Current + visual indicator	○	○	○	○	○
▲ SP control only						
23	Surface coating					
A	– Primer blue ▼	●	●	●	●	●
0	– Rust inhibitor oil	○	○	○	○	○
▼ Other finishes on request.						
24	Control model code					
See fields 24 to 48 on following pages.						
Pump Size		66	90	130	180	250

Note:

▲ 66cc will get new design (similar to 90 cc) and all counter-clockwise of 66cc will be outfaced in 2018.

Control overview

For additional control options
Please look into details of modelcoding

Open Loop Pumps
X Series - Basic Pumps

- D F** Pressure compensator
with or without load sense
- L R** Power limiter control
with or without pressure compensation
with or without load sense
- S T** Electronic flow control
electrical feedback, neutral position at max. displacement
with or without pressure and/or power limiter override
- F M** Screw adjustment flow control
manual flow control by screw adjustment
- Z P** Dual displacement control
flow control for 2 displacements, switchable by on/off valve

Preferred

- shortest lead time
- cost effective

-
- S P** Electronic flow control
electr. feedback, neutral position at zero displacement
with or without pressure limiter override
 - E S** Electric motor flow control
electromechanical flow control with gearbox and limit switches

On request only

- longer lead times
- standard pricing

Note: FE, HG, DP, SM and DQ old controls should not be used anymore.

Model code

Open Loop Pumps
X Series - DF Control

- Preferred standard option
- Other standard option
- Special option on request

D F 0 0 0 A * * 0 0 0 0 * 0 0 * * * * * * * * * *
 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

	Pump Size	66	90	130	180	250
24 25 Control Type						
DF – Pressure compensator		●	●	●	●	●
26 Displacement adjustment options						
0 – Not applicable						
27 28 Electronic amplifier						
00 – Not applicable						
29 Yoke displacement zone						
A – Single side of centre “A”		●	●	●	●	●
30 Additional functions						
0 – None		●	●	●	●	●
1 – Load sensing (standard $\Delta p = 15$ bar)		●	●	●	●	●
A – 2-level pressure compensator, 4/2 solenoid valve		○	○	○	○	○
B – 2-level pressure compensator, 4/3 solenoid valve		○	○	○	○	○
31 Pressure control options						
0 – None i.e. pilot operated with remote port (standard arrangement)		●	●	●	●	●
F – Remote port without pilot valve		○	○	○	○	○
K – Electro - proportional relief valve, complete with electronic card		○	○	○	○	○
L – Electro - proportional relief valve with OBE		○	○	○	○	○
S – Slow upstroke screw adjustment		○	○	○	○	○
32 33 34 Power control						
000 – Not applicable						
35 Pilot oil filter						
0 – Not applicable						
Pump Size		66	90	130	180	250

	Pump Size	66	90	130	180	250
36 Venting valve						
0 – None		●	●	●	●	●
1 – Solenoid valve ▼		○	○	○	○	○
▼ Specify voltage in 39						
37 Position monitoring						
0 – Not applicable						
38 Electric motor type						
0 – Not applicable						
39 Control voltage						
0 – Not applicable		●	●	●	●	●
H – 24V DC (preferred voltage)		●	●	●	●	●
B – 110V AC 50 Hz / 120V AC 60 Hz		○	○	○	○	○
D – 230V AC 50 Hz / 240V AC 60 Hz		○	○	○	○	○
40 41 Customer adjustment specification						
42 43						
0000 – None		●	●	●	●	●
**** – Danfoss assigned number as per data specified in table below ◇		○	○	○	○	○
44 45 46 Special features						
000 – None		●	●	●	●	●
*** – Defined by Danfoss		○	○	○	○	○
47 48 Design number						
** – 10-99 assigned by Danfoss		●	●	●	●	●
Pump Size		66	90	130	180	250

◇ Example for customer adjustments specifications

Special pressure adjustment	Main stage pressure control	Pilot valve ▲ pressure control	Load sense Δp
Standard setting (bar)	20	90	15
Max. setting (bar)	40	350	40
Customer-specified adjustment (bar)	.....	.....	.....

▲ **Note:** Setting must be at least 30bar.

Special max. Displ. Adjustment	Minimum displacement	Maximum displacement
Standard	0 cm ³ /rev	100%
Customer-specified adjustment (cm ³ /rev)	.....	.....

Note: Special pressure adjustments and/or maximum displacement adjustments are the most common reasons for using this option. Max. displacement adjustable by screw or stop ring - refer basic pump model code pos 13.

Model code

Open Loop Pumps
X Series - LR Control

- Preferred standard option
- Other standard option
- Special option on request

L R 0 0 0 A * * * * * 0 * 0 0 * * * * * * * * * *
 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

	Pump Size	66	90	130	180	250
24 25 Control type						
LR – Power control		●	●	●	●	●
26 Displacement adjustment options						
0 – Not applicable						
27 28 Electronic amplifier						
00 – Not applicable						
29 Yoke displacement zone						
A – Single side of centre “A”		●	●	●	●	●
30 Additional functions						
2 – Pressure limiter ▲		●	●	●	●	●
3 – Load sensing and pressure limiter (standard Δp = 15 bar)		●	●	●	●	●
▲ To select Power Control without Pressure Limiter, specify ... LR ... A2F.						
31 Pressure control options						
0 – None i.e. pilot operated with remote port (standard arrangement)		●	●	●	●	●
F – Remote port without pilot valve		○	○	○	○	○
K – Electro - proportional relief valve, complete with electronic card		○	○	○	○	○
L – Electro - proportional relief valve with OBE		○	○	○	○	○
S – Slow upstroke screw adjustment		○	○	○	○	○
32 33 34 Power control specification						
*** – 3-digit value in kW at 1500 rpm		●	●	●	●	●
35 Pilot oil filter						
0 – Not applicable						

	Pump Size	66	90	130	180	250
36 Venting valve						
0 – None		●	●	●	●	●
1 – Solenoid valve ▼		○	○	○	○	○
▼ Specify voltage in 39						
37 Position monitoring						
0 – Not applicable						
38 Electric motor type						
0 – Not applicable						
39 Control Voltage						
0 – Not applicable		●	●	●	●	●
H – 24V DC (Preferred voltage)		●	●	●	●	●
B – 110V AC 50 Hz / 120V AC 60 Hz		○	○	○	○	○
D – 230V AC 50 Hz / 240V AC 60 Hz		○	○	○	○	○
40 41 Customer adjustment specification						
42 43						
0000 – None		●	●	●	●	●
**** – Danfoss assigned number as per data specified in table below ◊		○	○	○	○	○
44 45 46 Special features						
000 – None		●	●	●	●	●
*** – Defined by Danfoss		○	○	○	○	○
47 48 Design number						
** – 10-99 assigned by Danfoss		●	●	●	●	●

◊ Example for customer adjustment specifications A2 29 30

Special pressure adjustment	Main stage pressure control	Pilot valve ▲ pressure control	Load sense Δp
Standard setting (bar)	20	90	15
Max. setting (bar)	40	350	40
Customer-specified adjustment (bar)	.....	.....	.....

▲ Note: Setting must be at least 30bar.

Special max. Displ. Adjustment	Minimum displacement	Maximum displacement
Standard	0 cm ³ /rev	100%
Customer-specified adjustment (cm ³ /rev)	.....	.....

Note: Special pressure adjustments and/or maximum displacement adjustments are the most common reasons for using this option. Max. displacement adjustable by screw or stop ring- refer basic pump model code pos 13.

Model code

Open Loop Pumps

X Series - ST Control

[21] = **K**, **M** or **L** mandatory
(HP lubrication)

[22] = **L** mandatory
(electrical yoke position indicator)

- Preferred standard option
- Other standard option
- Special option on request

S T * * * A * * * * * * * 0 0 0 * * * * * * * * *

[24] [25] [26] [27] [28] [29] [30] [31] [32] [33] [34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45] [46] [47] [48]

	Pump Size	66	90	130	180	250
[24] [25] Control type						
S T – Electronic flow control by proportional valve		●	●	●	●	●
[26] Displacement adjustment options						
C – With CETOP 3 proportional valve		●	●	●	●	●
A – With CETOP 3 interface (no valve)		○	○	○	○	○
D – CETOP 3 proportional valve KBSDGV-4 with OBE (electr. amplifier necessary for flow control)		○	○	○	○	○
G – CETOP 3 Axis-Pro. OBE valve with integr. flow control (no add. amplifier necessary)		○	○	○	○	○
[27] [28] Electronic amplifier						
03 – With ER9.3 amplifier card		●	●	●	●	●
05 – With DIN rail module		○	○	○	○	○
00 – Without electronics		○	○	○	○	○
[29] Yoke displacement zone						
A – Single side of centre “A”		●	●	●	●	●
[30] Extra functions						
0 – Without additional options		●	●	●	●	●
4 – Pressure limiter override		○	○	○	○	○
5 – Pressure limiter and power limiter override		○	○	○	○	○
[31] Pressure limiter control options						
0 – Including pilot relief valve and remote port option		●	●	●	●	●
F – Remote port only		○	○	○	○	○
K – Proportional relief valve + EEA-PAM amplifier card		○	○	○	○	○
L – Proportional relief valve with integrated Electronics OBE		○	○	○	○	○
[32] [33] [34] Power control setting options						
000 – No power limiter override		●	●	●	●	●
*** – 3-digit value in kW at 1500 rpm		●	●	●	●	●
[35] Pilot oil filter						
0 – Without filter		●	●	●	●	●
E – Filter with electr. indicator		○	○	○	○	○
Pump Size	66	90	130	180	250	

	Pump Size	66	90	130	180	250
[36] Pilot oil supply						
A – Internal pilot oil supply only		●	●	●	●	●
B – External pilot oil supply only		○	○	○	○	○
C – Internal + external pilot oil supply by check valve		○	○	○	○	○
[37] Position monitoring						
0 – Not applicable						
[38] Electric motor type						
0 – Not applicable						
[39] Control voltage						
0 – Not applicable						
[40] [41] [42] [43] Customer adjustment specification						
0000 – None		●	●	●	●	●
**** – Danfoss assigned number as per data specified in table below ◇		○	○	○	○	○
[44] [45] [46] Special features						
000 – None		●	●	●	●	●
*** – Defined by Danfoss		○	○	○	○	○
[47] [48] Design number						
** – 10-99 assigned by Danfoss		●	●	●	●	●

Pump Size 66 90 130 180 250

◇ Example for customer adjustment specifications A4/A5 [29] [30]

Special pressure adjustment	Main stage pressure control	Pilot valve ▲ pressure control
Standard setting (bar)	20	90
Max. setting (bar)	40	350
Customer-specified adjustment (bar)	.....	.....

▲ Note: Setting must be at least 30bar.

Special max. Displ. Adjustment	Minimum displacement	Maximum displacement
Standard	0 cm³/rev	100%
Customer-specified adjustment (cm³/rev)	.....	.....

Note: Special pressure adjustments and/or maximum displacement adjustments are the most common reasons for using this option. Max. displacement adjustable by screw or by stop ring- refer basic pump model code pos 13.

Notes:

- ST control requires a min. operation pressure of >25 bar for operation. For internal pilot oil supply it must be assured that this load pressure can be provided. Below this min. pressure value pump will automatically go on max. stroke.
- External ST control pilot pressure needs to be equal or more than 35% of max. load pressure

Model code

- Preferred standard option
- Special option on request

Open Loop Pumps
X Series - FM Control

F M 0 0 0 A 0 0 0 0 0 0 0 0 0 0 0 * * * * * * * * *

24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

	Pump Size	66	90	130	180	250
Control type						
FM – Screw adjustment control displacement range 50-100%		●	●	●	●	●
Displacement adjustment options						
G – Not applicable						
Electronic amplifier						
00 – Not applicable						
Yoke displacement zone						
A – Single side of centre "A"		●	●	●	●	●
Additional functions						
0 – Not applicable						
Pressure control options						
0 – Not applicable						
Power control specification						
000 – Not applicable						
Pilot oil filter						
0 – Not applicable						
Pump Size		66	90	130	180	250

	Pump Size	66	90	130	180	250
Venting valve						
0 – Not applicable						
Position monitoring						
0 – Not applicable						
Electric motor type						
0 – Not applicable						
Control voltage						
0 – Not applicable						
Customer adjustment specification						
0000 – None		●	●	●	●	●
**** – Danfoss assigned numbers as per data specified in table below ◇		○	○	○	○	○
Special features						
000 – None		●	●	●	●	●
*** – Defined by Danfoss		○	○	○	○	○
Design number						
** – 10-99 assigned by Danfoss		●	●	●	●	●
Pump Size		66	90	130	180	250

◇ Example for customer adjustment specifications

Special max. Displ. adjustment	Minimum displacement	Maximum displacement
Standard	50%	100%
Customer-specified adjustment (cm ³ /rev)	.....	.....

Note: Special pressure adjustments and/or maximum displacement adjustments are the most common reasons for using this option.

Notes:

- Adjustable only with load pressure ≤30 bar
- Factory setting 100%

Model code

Open Loop Pumps
X Series - ZP Control

- Preferred standard option
- Other standard option
- Special option on request

Z P * * * A 0 0 0 0 0 0 * 0 0 0 * * * * * * * *

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	Pump Size	66	90	130	180	250
24 25 Control type						
ZP – Dual displacement control		●	●	●	●	●
26 Displacement adjustment options						
1 – 4/2 solenoid valve		●	●	●	●	●
A – With CETOP 3 interface (no valve)		○	○	○	○	○
27 28 Electronic amplifier						
00 – Not applicable						
29 Yoke displacement zone						
A – Single side of center "A"		●	●	●	●	●
30 Extra functions						
0 – Not applicable						
31 Pressure limiter control options						
0 – Not applicable						
32 33 34 Power control specification						
000 – Not applicable						
35 Pilot oil filter						
0 – Not applicable						
Pump Size	66	90	130	180	250	

	Pump Size	66	90	130	180	250
36 Pilot oil supply						
A – Internal pilot oil supply only		●	●	●	●	●
B – External pilot oil supply only		○	○	○	○	○
C – Internal + external pilot oil supply by check valve		○	○	○	○	○
37 Position monitoring						
0 – Not applicable						
38 Electric motor type						
0 – Not applicable						
39 Control Voltage						
0 – Not applicable						
40 41 42 43 Customer adjustment specification						
0000 – None		●	●	●	●	●
**** – Danfoss assigned numbers per data specified in table below ◇		○	○	○	○	○
44 45 46 Special features						
000 – None		●	●	●	●	●
*** – Defined by Danfoss		○	○	○	○	○
47 48 Design number						
** – 10-99 assigned by Danfoss		●	●	●	●	●
Pump Size	66	90	130	180	250	

◇ Example for customer adjustment specifications

Special max. Displ. Adjustment	Minimum displacement	Maximum displacement
Standard	0 cm ³ /rev	100%
Customer-specified adjustment (cm ³ /rev)	.....	.....

Note: Special pressure adjustments and/or maximum displacement adjustments are the most common reasons for using this option.

Notes:

- Basic position has max. displacement (solenoid de-energized)
- Standard setting for minimum displacement: 50%

Model code

Open Loop Pumps

X Series - SP Control

[22] = P or M mandatory
(electrical yoke position indicator)

- Preferred standard option
- Other standard option
- Special option on request

S P * * * A * * * * * * 0 0 0 0 * * * * * * * * * *
 [24] [25] [26] [27] [28] [29] [30] [31] [32] [33] [34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45] [46] [47] [48]

	Pump Size	66	90	130	180	250
[24] [25] Control type						
SP – Displacement adjustment control via proportional valve		○	○	○	○	○
[26] Displacement adjustment options						
C – CETOP 3 proportional valve KDG4V3		●	●	●	●	●
A – CETOP 3 interface only		○	○	○	○	○
[27] [28] Electronic amplifier						
03 – With ER9.3 amplifier card		●	●	●	●	●
05 – With DIN rail module		○	○	○	○	○
00 – Without electronics		○	○	○	○	○
[29] Yoke displacement zone						
A – Single side of centre “A”		●	●	●	●	●
[30] Additional functions						
0 – None		●	●	●	●	●
4 – Pressure limiter override		●	●	●	●	●
[31] Pressure control options						
0 – Including pilot relief valve and remote port option		●	●	●	●	●
F – Remote port only		○	○	○	○	○
K – Proportional relief valve + EEA-PAM amplifier card		○	○	○	○	○
L – Relief valve with integrated Electronics OBE		○	○	○	○	○
[32] [33] [34] Power control specification						
000 – Not applicable						
[35] Pilot oil filter						
E – Filter with electrical and visual indicator		●	●	●	●	●
0 – None		○	○	○	○	○
V – Filter with electrical and visual indicator		○	○	○	○	○
Pump Size	66	90	130	180	250	

	Pump Size	66	90	130	180	250
[36] Venting valve						
0 – Not applicable						
[37] Position monitoring						
0 – Not applicable						
[38] Electric motor type						
0 – Not applicable						
[39] Control voltage						
0 – Not applicable						
[40] [41] [42] [43] Customer adjustment specification						
0000 – None		●	●	●	●	●
**** – Danfoss assigned numbers per data specified in table below ◇		○	○	○	○	○
[44] [45] [46] Special features						
000 – None		●	●	●	●	●
*** – Defined by Danfoss		○	○	○	○	○
[47] [48] Design number						
** – 10-99 assigned by Danfoss		●	●	●	●	●
Pump Size	66	90	130	180	250	

◇ Example for customer adjustment specifications

Special pressure adjustment	Main stage pressure control	Pilot valve ▲ pressure control
Standard setting (bar)	20	90
Max. setting (bar)	40	350
Customer-specified adjustment (bar)	.....	.....

▲ Note: Setting must be at least 30bar.

Special max. Displ. Adjustment	Minimum displacement	Maximum displacement
Standard	0 cm ³ /rev	100%
Customer-specified adjustment (cm ³ /rev)	.....	.....

Note: Special pressure adjustments and/or maximum displacement adjustments are the most common reasons for using this option. Max. displacement adjustable by screw or stop ring- refer basic pump model code pos 13.

Model code

Open Loop Pumps
X Series - ES control

- Preferred standard option
- Other standard option
- Special option on request

E S * 0 0 A 0 0 0 0 0 0 0 * * 0 * * * * * * * * *
 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

	Pump Size	66	90	130	180	250
24 25 Control type						
ES – Displacement adjustment control via electric motor		○	○	○	○	○
26 Displacement adjustment options						
N – Electric motor, medium response		●	●	●	●	●
M – Electric motor, fast response		○	○	○	○	○
P – Electric motor, slow response		○	○	○	○	○
27 28 Control electronics						
00 – Not applicable						
29 Yoke displacement zone						
A – Single side of centre "A"		●	●	●	●	●
30 Additional functions						
0 – Not applicable						
31 Pressure control options						
0 – Not applicable						
32 33 34 Power control specification						
000 – Not applicable						
35 Pilot oil filter						
0 – Not applicable						
	Pump Size	66	90	130	180	250

	Pump Size	66	90	130	180	250
36 Venting valve						
0 – Not applicable						
37 Position monitoring						
A – 4 limit switches		●	●	●	●	●
B – 8 limit switches		○	○	○	○	○
P – 4 limit switches + yoke pos. feedback (potentiometer)		○	○	○	○	○
T – 8 limit switches + yoke pos. feedback (potentiometer)		○	○	○	○	○
38 Electric motor type						
2 – Motor with brake (IP54)		●	●	●	●	●
3 – Motor without brake (explosion proof)		○	○	○	○	○
39 Control voltage						
0 – Not applicable						
40 41 42 43 Customer adjustment specification						
0000 – None		●	●	●	●	●
**** – Danfoss assigned to numbers as per data specified in table below ◇		○	○	○	○	○
44 45 46 Special features						
000 – None		●	●	●	●	●
*** – Defined by Danfoss		○	○	○	○	○
47 48 Design Number						
** – 10-99 assigned by Danfoss		●	●	●	●	●
	Pump Size	66	90	130	180	250

◇ Example for customer adjustment specifications

Special max. Displ. Adjustment	Minimum displacement	Maximum displacement
Standard	0 cm ³ /rev	100%
Customer-specified adjustment (cm ³ /rev)	.....	.....

Note: Special response times (see table in ES section of Control options) and/or maximum displacement adjustments are the most common reasons for using this option

Pump size	Adjustment time (sec)		
	M	N	P
066/090	7,5	15	38
130/180	18	35	86
250	10	20	48

Model code

Open Loop Pumps

X Series - No control: [2] = F

Fixed displacement PF X Models

- Preferred standard option
- Other standard option
- X Not available

0 0 0 0 0 A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 * * * * *

[24] [25] [26] [27] [28] [29] [30] [31] [32] [33] [34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45] [46] [47] [48]

		Pump Size	66	90	130	180	250
24 25	Control type						
00	– No control		•	•	•	•	X
26	Displacement adjustment options						
0	– Not applicable						
27 28	Control electronics						
00	– Not applicable						
29	Yoke displacement zone						
A	– Single side of center "A"		•	•	•	•	X
30	Additional functions						
0	– Not applicable						
31	Pressure control options						
0	– Not applicable						
32 33 34	Power control specification						
000	– Not applicable						
35	Pilot oil filter						
0	– Not applicable						
		Pump Size	66	90	130	180	250

		Pump Size					
		66	90	130	180	250	
36	Venting valve						
0	– Not applicable						
37	Position monitoring						
0	– Not applicable						
38	Electric motor type						
0	– Not applicable						
39	Control voltage						
0	– Not applicable						
40 41 42 43	Customer adjustment specification						
0000–	None	•	•	•	•	X	
44 45 46	Special features						
000	None	•	•	•	•	X	
***	Defined by Danfoss	○	○	○	○	X	
47 48	Design number						
**	10-99 assigned by Danfoss	•	•	•	•	X	
		Pump Size	66	90	130	180	250

Note: Available displacement [6], [7], [8] (Page 4)

- Preferred standard option

P * X C - * * * * * * * * * * * * * * * * * * H C 8 1 * * * * * * * * * *

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

				Unit Position	1	2	3	4
11	12	13	Second displacement cm³/rev (in³/rev)					
– Options as first displacement						•		
14	15	Second control type						
– Options as first displacement						•		
16	17	18	Third displacement					
0	– Options as displacement						•	
19	20	Third control type						
A	– Options as control						•	
21	22	23	Fourth displacement					
– Options as displacement								•
24	25	Fourth control type						
– Options as control								•
26	27	Assembly number						
28	29							
HC81					•	•	•	•
30	31	32	Assembly number Defined by Danfoss					
33	34	35						
36	37	38			•	•	•	•
39								
				Unit Position	1	2	3	4

Form Page

or special features (**44** to **46**) are needed, please provide the information when ordering.

For combination units, you may need to provide an additional model code. In such a case, each single pump section must be specified separately using this or other Danfoss catalog information. Where characters are already stated in the blank Model Code, there is no option available.

Explanation for each character	Codes
Basic PumpModel Code	1 to 23
Control Options	24 to 39
Customer AdjustmentSpecification	40 to 43
Special Features	44 to 46
Design Number	47 & 48
Combination Units Model Code	1 to 39

[illegible]

Pump specifications

Metric

Model			66	90	130	180	250
Design			Swashplate – Axial piston pump				
Type of mounting			Flange or foot-mounted - Combination units foot mounted only				
Pipe connection Flange ISO 6162-1 (SAE J518 code 61) ISO 6162-2 (SAE J518 code 62)	B A	psi	P38M (1 1/2" - 500) P25M (1" - 6000)	P51M (2" - 500) P25M (1" - 6000)	P64M (2 1/2" - 500) P25M (1" - 6000)	P64M (2 1/2" - 500) P32M (1 1/4" - 6000)	P89M (3 1/2" - 500) P32M (1 1/4" - 6000)
Direction of rotation			Clockwise, Counterclockwise on request				
Mounting attitude			Horizontal, other mounting options are available on request				
Ambient temperature range	min max	°C	-20 50				
Weight	M	kg	55	75	106	114	212
Moment of inertia	J	kg m²	0.016	0.016	0.045	0.045	0.146

Hydraulic characteristics

Rated pressure (100% duty cycle)	p _N	bar	350				
Inlet pressure	p _{1min} p _{1max}	bar	0.85 abs 10	0.85 abs 10	0.95 abs 10	0.95 abs 10	1.0 abs 10
Max. pressure to ISO 5598:2008	p _{2max}	bar	420				
Hydraulic fluid			Hydraulic oil to DIN 51524 part 2 See fluid recommendations in application data				
Hydraulic fluid temperature range	min max	°C	-25 (on start up) 90				
Viscosity range for continuous operation	min max	cSt	10 75				
Maximum permissible start viscosity	max	cSt	1000				
Cleanliness	ISO 4406		18/15/13				
Maximum geometric displacement	V _g	cm³/rev	66	90	130	180	250
Speed range	min max	rev/min	150 1800				
Case pressure (over pressure)	p _{case}	bar					
n = 1200 rev/min			3.5	3.5	3.2	3.2	2.8
n = 1500 rev/min			2.7	2.7	2.5	2.5	2.1
n = 1800 rev/min			2.2	2.2	2.0	2.0	1.7

The differential between case pressure and inlet pressure should not exceed 0,5 bar.

Drive

Driving torque (p _N = 350 bar, V _g at 1500 rev/min, η = 100%)	M _{1single}	Nm	367	501	724	1002	1392
Power consumption (p _N = 350 bar, n = 1500 rev/min, η = 100%)	P _{1single}	kW	57,8	78,8	113,8	157,5	218,8

Combination units

Maximum driving torque limited to splined shaft only - comb. unit	M _{1Comb.}	Nm	2x367	2x501	2x724	2x1002	2x1392
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Pump specifications

US

Model			66	90	130	180	250
Design			Swashplate – Axial piston pump				
Type of mounting			Flange or foot-mounted - Combination units foot mounted only				
Pipe connection Flange	B A	psi	P38M (1 1/2" - 500)	P51M (2" - 500)	P64M (2 1/2" - 500)	P64M (2 1/2" - 500)	P89M (3 1/2" - 500)
ISO 6162-1 (SAE J518 code 61)			P25M (1" - 6000)	P25M (1" - 6000)	P25M (1" - 6000)	P32M (1 1/4" - 6000)	P32M (1 1/4" - 6000)
ISO 6162-2 (SAE J518 code 62)							
Direction of rotation			Clockwise, Counterclockwise on request				
Mounting attitude			Horizontal, other mounting options are available on request				
Ambient temperature range	Min Max	°F	-4 122				
Weight	M	lb	121	165	234	251	467
Moment of inertia	J	lb ft²	0.38	0.38	1.068	1.068	3.465

Hydraulic characteristics

Rated pressure (100% duty cycle)	p _N	psi	5000				
Inlet pressure	p _{1min} p _{1max}	psi	12,3 145	12,3 145	13,8 145	13,8 145	14,5 145
Max. pressure to ISO 5598:2008	p _{2max}	psi	6000				
Hydraulic fluid			Hydraulic oil to DIN 51524 part 2 See fluid recommendations in application data				
Hydraulic fluid temperature range	min max	°F	-13 (on start up) 194				
Viscosity range for continuous operation	min max	cSt	10 75				
Maximum permissible start viscosity	max	cSt	1000				
Cleanliness	ISO 4406		18/15/13				
Maximum geometric displacement	V _g	in³	4.0	5.5	8.0	11.0	15.3
Speed range	min max	rev/min	150 1800				
Case pressure (overpressure)	p _{case}	psi					
n = 1200 rev/min			50	50	46	46	40
n = 1500 rev/min			39	39	36	36	30
n = 1800 rev/min			32	32	29	29	24

The differential between case pressure and inlet pressure should not exceed 3,625 psi.

Drive

Driving torque (p _N = 5075 psi, V _g at 1500 rev/min, η = 100%)	M _{1 single}	lbf ft	271	369	534	739	1027
Power consumption (p _N = 5075 psi, n = 1500 rev/min, η = 100%)	P _{1 single}	hp	77.5	105.5	152.5	211	293

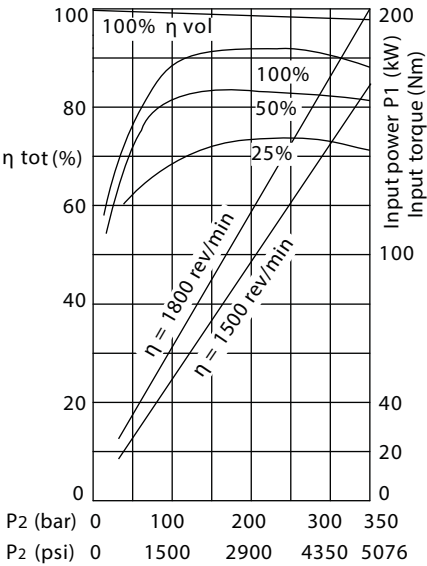
Combination units

Maximum driving torque limited to splined shaft only - comb. unit	M _{1 Comb.}	lbf ft	2x271	2x369	2x534	2x739	2x1027
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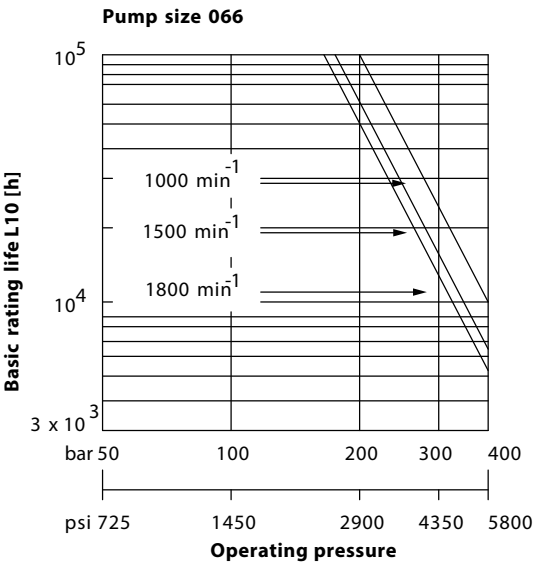
Performance curves

066 & 090 Series

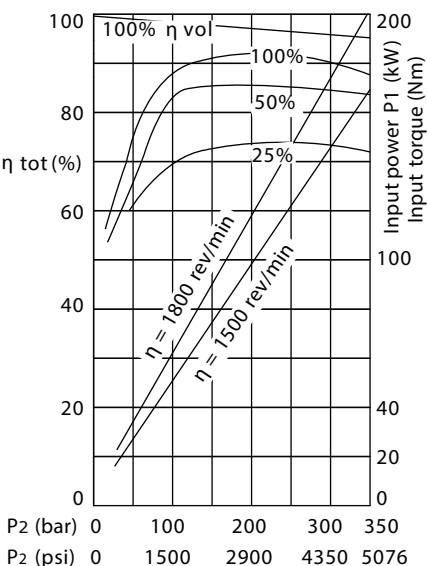
Power efficiency performance curve
Size 066



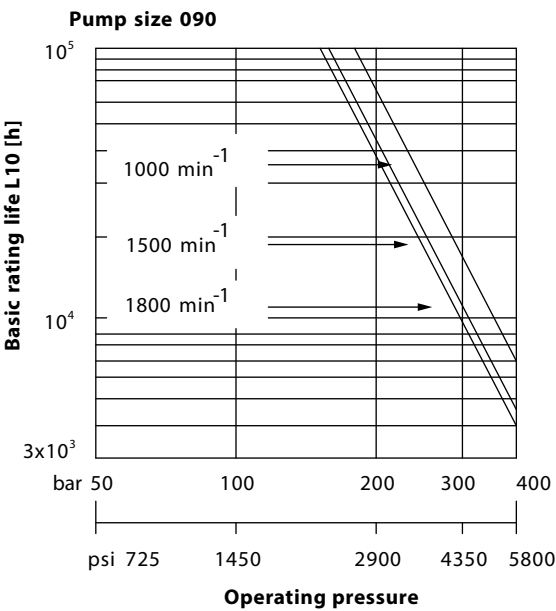
Theoretical bearing lifetime
Size 066



Power efficiency performance curve
Size 090



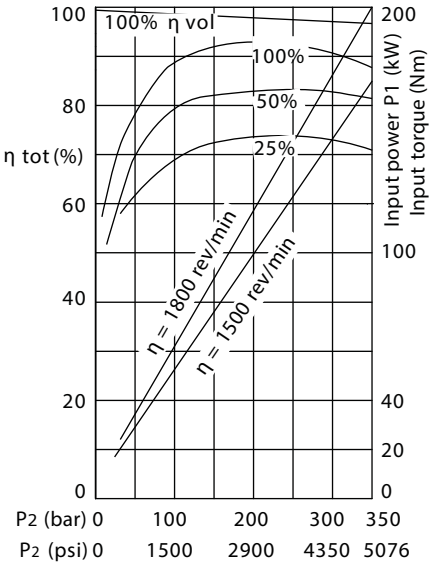
Theoretical bearing lifetime
Size 090



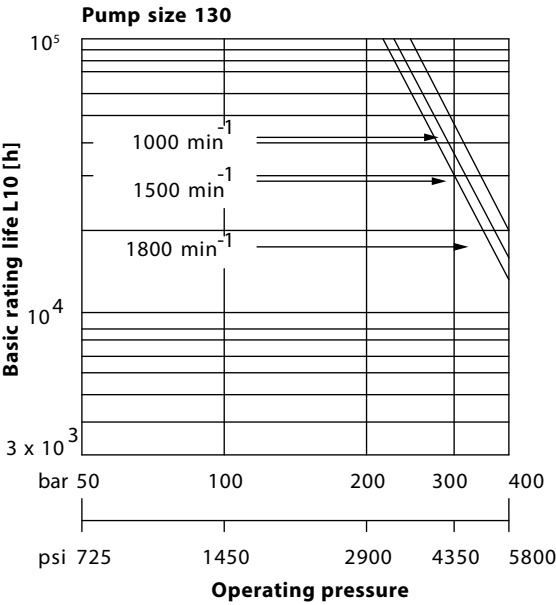
Performance curves

130 & 180 Series

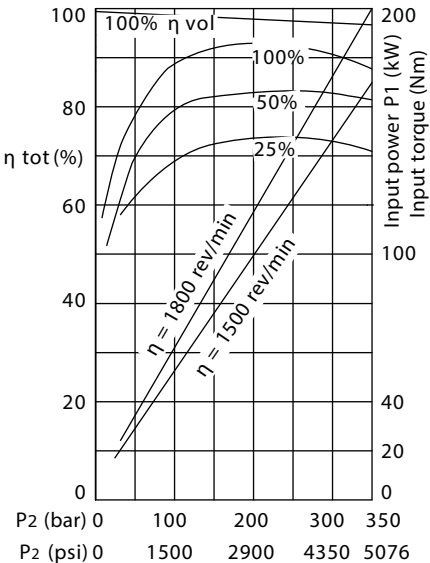
Power efficiency performance curve
Size 130



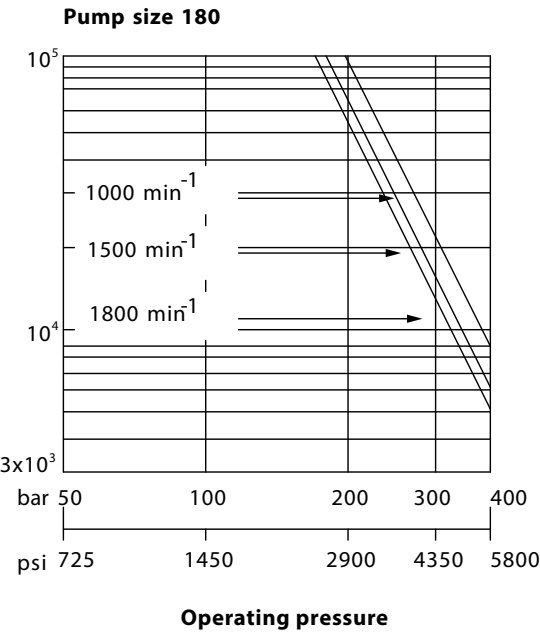
Theoretical bearing lifetime
Size 130



Power efficiency performance curve
Size 180



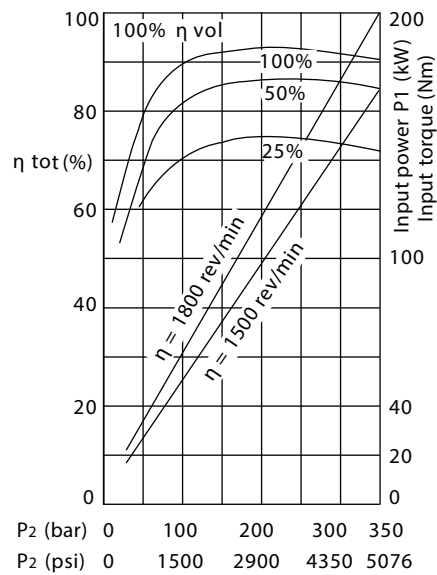
Theoretical bearing lifetime
Size 180



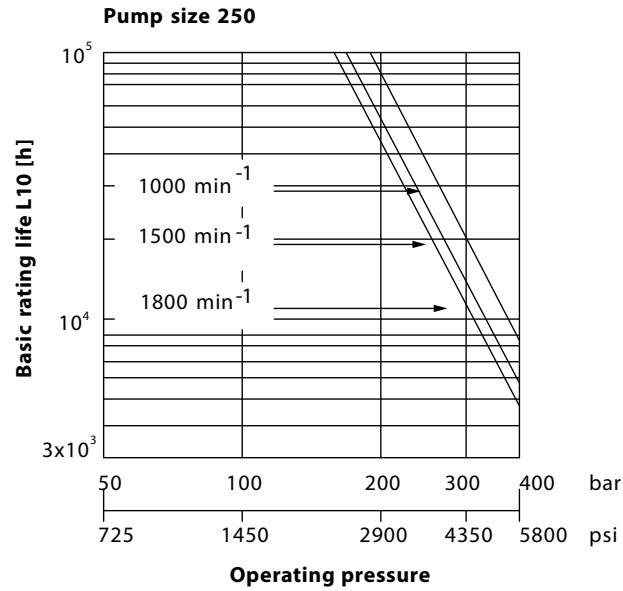
Performance curves

250 Series

Power efficiency performance curve
Size 250



Theoretical bearing lifetime
Size 250



Installation and start-up

Warning

Care should be taken that mechanical and hydraulic resonances are avoided in the application of the pump. Such resonances can seriously compromise the life and/or safe operation of the pump.

Drive Data

Mounting attitude should be horizontal using the appropriate case drain ports to ensure that the case remains full of fluid at all times. Consult your local Danfoss representative if a different arrangement is required. In those cases where geometric tolerances of mounting are critical, or where specific tolerance ranges are required and not specified, consult Danfoss engineering for specific limits.

Direction of shaft rotation, viewed from the prime mover end, must be as indicated in the model designation on the pump – either right hand (clockwise) or left hand (counterclockwise). Direct coaxial drive through a flexible coupling is recommended. If drives imposing radial shaft loads are considered, please consult your Danfoss representative.

Start-up Procedure

Make sure the reservoir and circuit are clean and free of dirt/debris prior to filling with hydraulic fluid. Fill the reservoir with filtered oil and fill to a level sufficient enough to prevent vortexing at the suction connection to pump inlet. It is good practice to clean the system by flushing and filtering, using an external slave pump.

Caution

Before the pump is started, fill the case through the uppermost drain port with hydraulic fluid of the type to be used. The case drain line must be connected directly to the reservoir and must terminate below the oil level. Once the pump is started, it should prime within a few seconds. If the pump does not prime, check to make sure that there are no restrictions between the reservoir and the inlet to the pump, and that the pump is being rotated in the proper direction, and that there are no air leaks in the inlet line and connections. Also check to make sure that trapped air can escape at the pump outlet. After the pump is primed, tighten the loose outlet connections, then operate for five to ten minutes (unloaded) to remove all trapped air from the circuit. If the reservoir has a sight gage, make sure the fluid is clear – not milky.

Fluid Cleanliness

Hydrokraft pumps are rated in anti-wear petroleum fluids with a contamination level of 18/15/13 per ISO 4066. Operation in fluids with levels more contaminated than this is not recommended. Fluids other than petroleum, severe service cycles, or temperature extremes are cause for adjustment of these codes. Please contact your Danfoss Representative for specific duty cycle recommendation.

Danfoss Hydrokraft pumps, as with any variable displacement piston pumps, will operate with apparent satisfaction in fluids up to the rating specified here. Experience has shown however, that pump and hydraulic system life is not optimized with high fluid contamination levels (high ISO cleanliness codes).

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Danfoss publication 561 "Danfoss Guide to Systemic Contamination Control" available from your local Danfoss distributor. In this publication, filtration and cleanliness levels for extending the life of axial piston pumps and other system components are listed. Included is an excellent discussion of the selection of products needed to control fluid condition.

Application Data and Fluid Recommendations

Fluid Type	DIN/ISO Classification	Rated Pressure p_N (bar)	Maximum Speed (rev/min) ■			Recommended Seal Material	Maximum Operating Temperature (°C)	Bearing Life
			130 & 180 cm³	250 & 360 cm³	500 & 750 cm³			
Water Glycol ▲	HFC	250	1800	1500	1250	NBR	45	25-100%
HFDR (phosphate ester based)	HFDR	350	1500	1200	1000	FKM	60	100% ▼
HFDU (glycol based)	HFDU	350	1500	1200	1000	FKM	60	100% ▼
HFDU (ester based)	HFDU	350	1800	1500	1250	FKM	60	100% ▼
HEES (synthetic ester)	HEES	350	1800	1500	1250	FKM	60	100% ▼

■ See general specifications for speed limitation depending on displacement.

▲ For HFC operation, bearing flushing is mandatory. Highest speed only recommended at optimized application conditions.

Use Model Code [21] = "C" for seal option, and contact your Danfoss representative for validation.

Seal material can differ on an individual pump depending on specific seal function.

Bearing life with HFC fluid depends significantly on fluid temperature, cleanliness, quality, flushing and application parameters.

Typical values vary between 25% and 100% compared to mineral oil.

▼ Only fluids with fully saturated esters (iodine value <10) should be used.

HFDU and HEES fluids can be used at full ratings, but need to be monitored continuously to maintain quality and performance. The following important values should always be checked:

- Water content (<= 500 ppm)
- Fluid cleanliness (18/15/13 per ISO 4406)
- TAN value (no significant change from new oil)
- Viscosity (no significant change from new oil)
- Additives (no significant change from new oil)

Under harsh operation conditions, especially with regard to temperature and water content, ester-based HFDU and HFDR fluids are prone to hydrolysis, the resulting chemical processes and products of which could damage seals and other pump components. In general, the susceptibility to temperature and contamination is significantly higher than with standard mineral oils.

In line with Danfoss Germany GmbH T&C warranty conditions covering use of HFDR/HFDU/HEES fluids, fluid-related damage is excluded.

Case/Bearing Flushing

Case and bearing flushing are mandatory for HFC fluid operation, and recommended for all other conditions where the pump is operating for longer intervals at low pressure i.e. <20 bar (<300 psi) and/or low flow at high pressure (compensated mode).

Estimated Flushing Flow Values at 1500 rev/min

Pump Size (cm³/rev)	Flushing Flow (l/min)
066/90	4/5,5
130/180	7,5/11
250	15

Vertical Mounting

Vertical mounting of Hydrokraft pumps is possible, but venting and lubrication of shaft bearings can require special flushing and installation procedures. For details, please refer to the Hydrokraft Application Guideline Presentation available from your Danfoss representative.

High pressure lubrication / Hydrostatic Balancing for Yoke Bearings (half-cup bearings)

High-pressure bearing lubrication and balancing (Model Code [21] = "K") is recommended for operating conditions with either high cycle frequencies (very short up/downstroke times) and/or where the swashplate is constantly maintained at a certain angle for long periods of time (compensated mode).



For details and additional information, please refer to the "Hydrokraft Application Guideline Presentation" available from your Danfoss Representative.

Pump dimensions PVXS-066

Options illustrated:

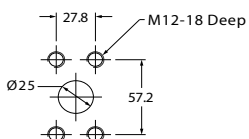
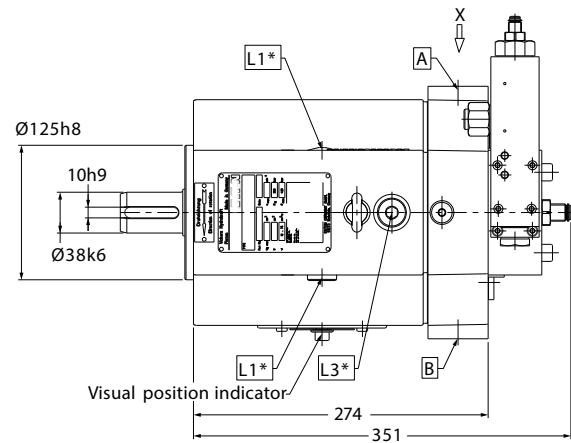
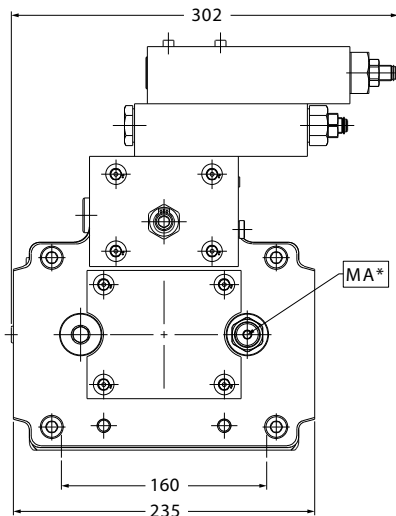
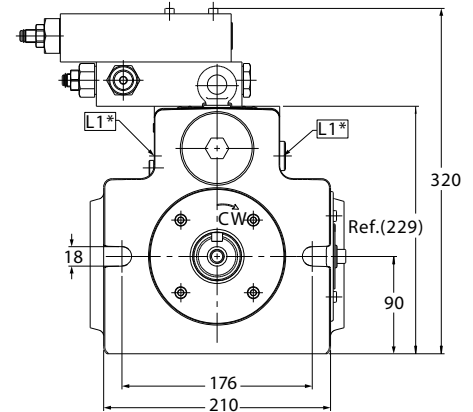
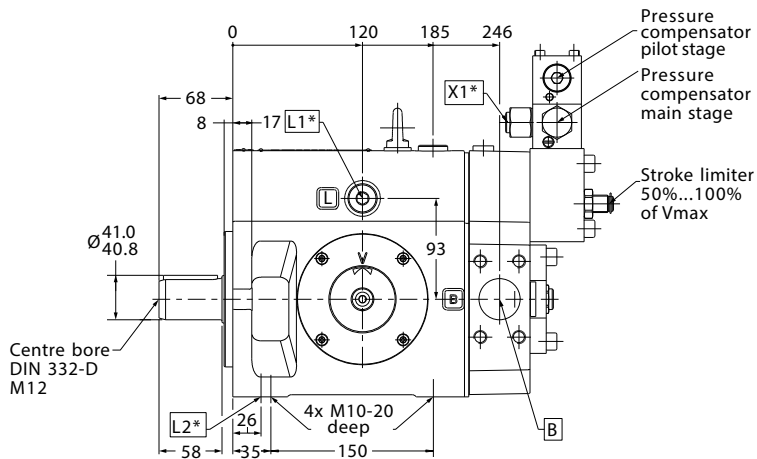
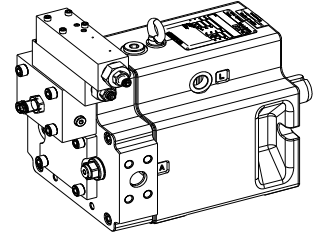
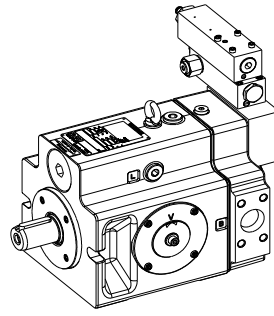
16 = **1** (A & B ports SAE, metric Thread)

17 = **R** (A & B ports radial)

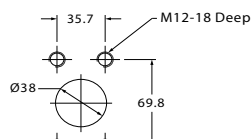
18 19 = **01** (ISO keyed shaft)

22 = V (visual indicator)

24 25 = DF control (pressure compensator)



Port A
View X

Port **B**

- | | |
|-----------|--|
| A | – System pressure port ISO 6162-2 P25M (SAE J518 CODE 62-1" - 6000 PSI) |
| B | – Inlet port ISO 6162-1 P38M (SAE J518 CODE 61 - 1 1/2" 500 PSI) |
| L1 | – Drain port M22x1.5 (According to mounting position use upper port) |
| L2 | – M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to L1 if the pumps installed with the shaft input end pointing upwards. |

- | | |
|-------------|--|
| L3 | - Oil filling 7/8" - 14 UNF or Bleed plug |
| MA | - Gauge port system pressure G1/4" |
| X1 | - Remote port pressure compensator G1/4"-12.5 Deep |
| ...* | Connection with plug |

Pump dimensions PVXS-066

Options illustrated:

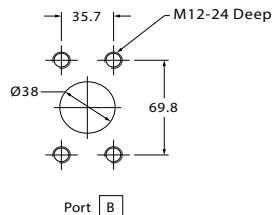
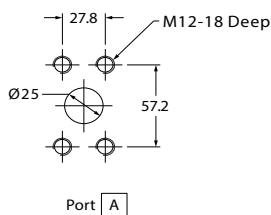
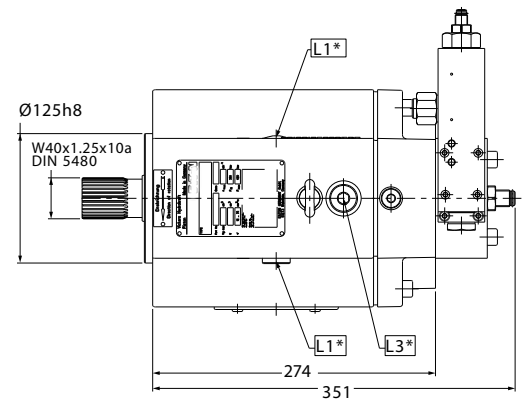
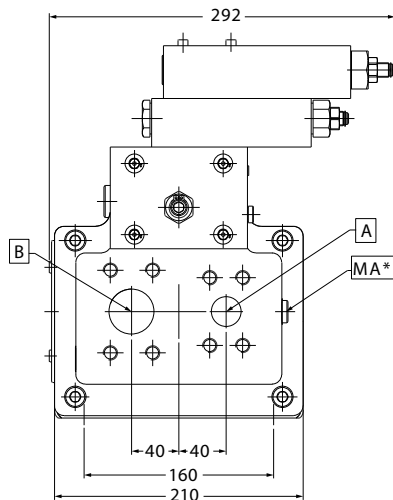
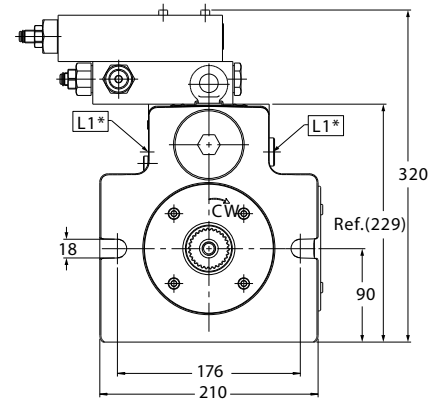
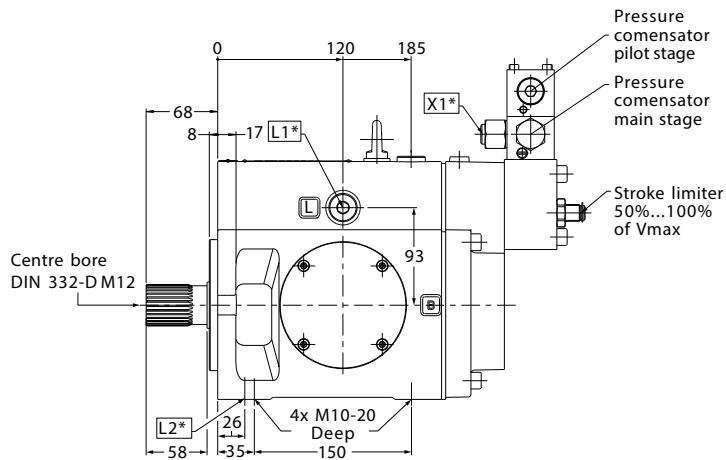
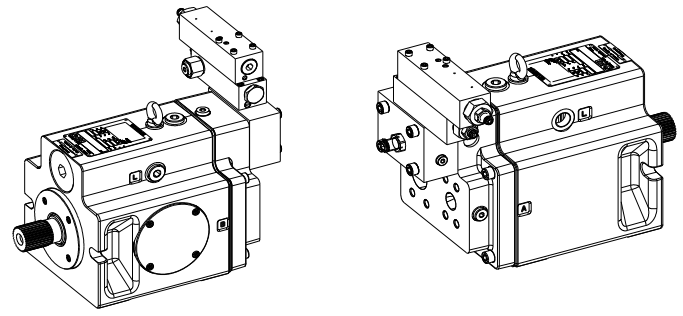
16 = 1 (A & B ports SAE, metric Thread)

17 = A (A & B ports axial)

1819 = **02** (Splined shaft)

$\boxed{22} = \mathbf{0}$ (no position indicator)

24 25 = DF control (pressure compensator)



- | | |
|-----------|--|
| A | - System pressure port ISO 6162-2 P25M (SAE J518 CODE 62-1" - 6000 PSI) |
| B | - Inlet port ISO 6162-1 P38M (SAE J518 CODE 61 - 1 1/2" 500 PSI) |
| L1 | - Drain port M22x1.5 (According to mounting position use upper port) |
| L2 | - M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to L1 if the pump is installed with the shaft input end pointing upwards. |

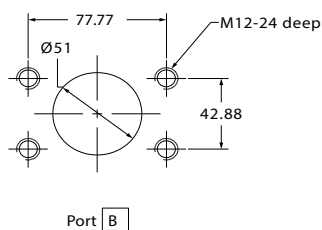
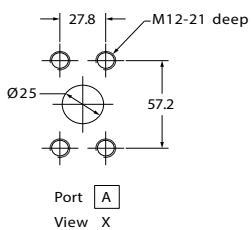
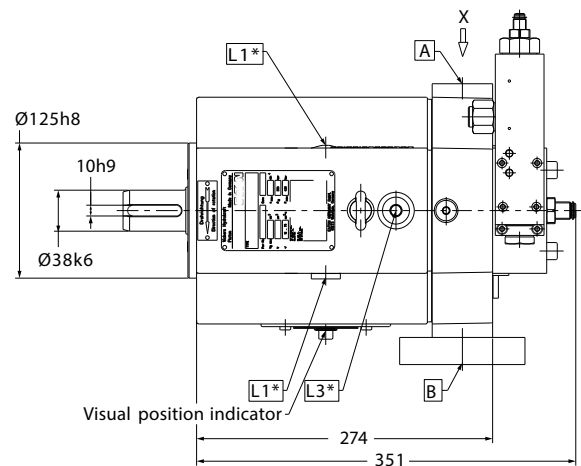
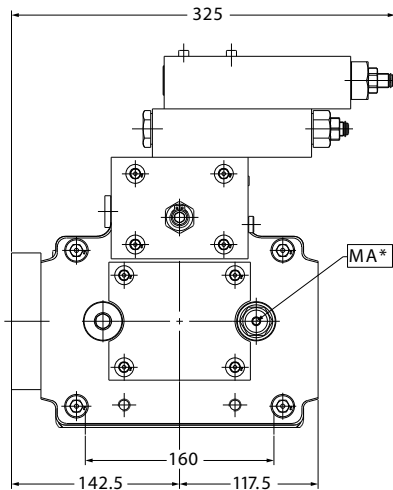
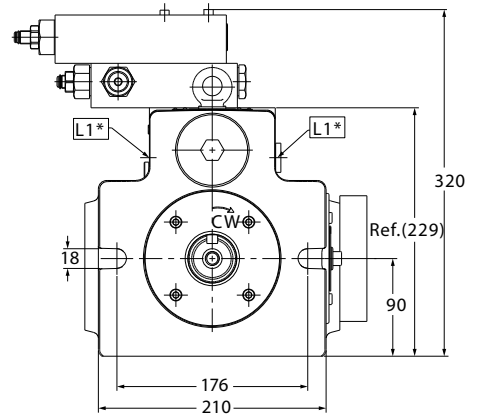
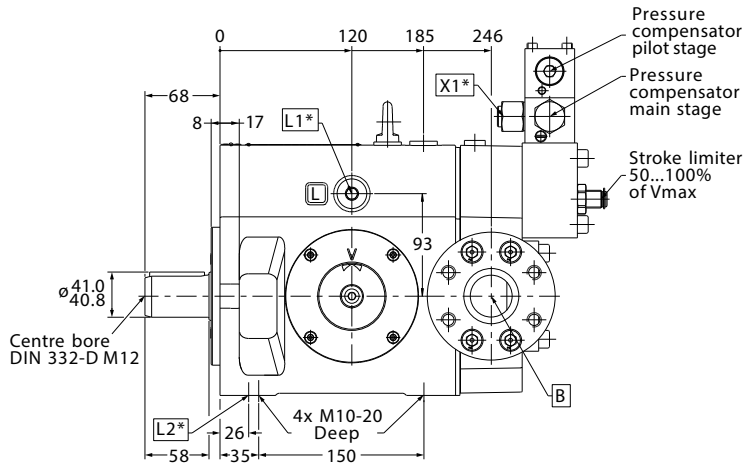
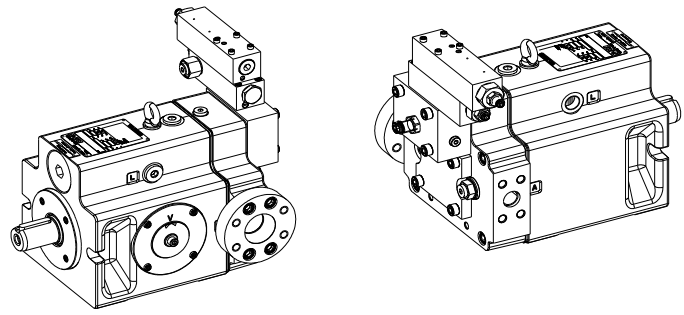
- | | |
|-------------|---|
| L3 | - Oil filling 7/8" - 14 UNF or Bleed plug |
| MA | - Gauge port system pressure G1/4" |
| X1 | - Remote port pressure compensator G 1/4" - 12.5 Deep |
| ...* | Connection with plug |

Pump dimensions

PVXS-090

Options illustrated:

- 16** = **1** (A & B ports SAE, metric Thread)
- 17** = **R** (A & B ports radial)
- 18/19** = **01** (ISO keyed shaft)
- 22** = **V** (visual indicator)
- 24/25** = **DF** control (pressure compensator)



- A** – System pressure port ISO 6162-2 P25M (SAE J518 CODE 62-1" - 6000 PSI)
- B** – Inlet port ISO 6162-1 P51M (SAE J518 CODE 61 - 2" 3000 PSI)
- L1** – Drain port M22x1.5 (According to mounting position use upper port)
- L2** – M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to **L1** if the pumps installed with the shaft input end pointing upwards.

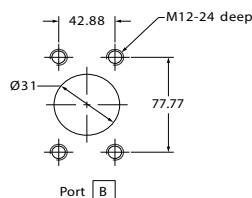
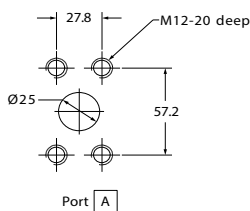
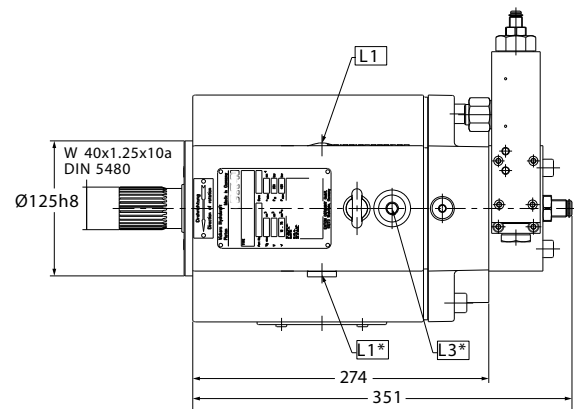
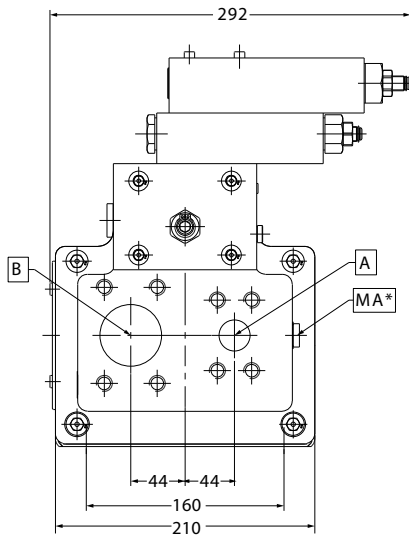
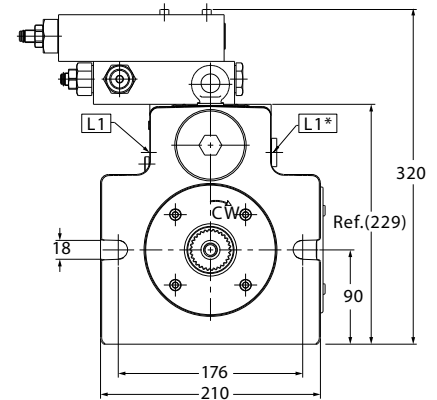
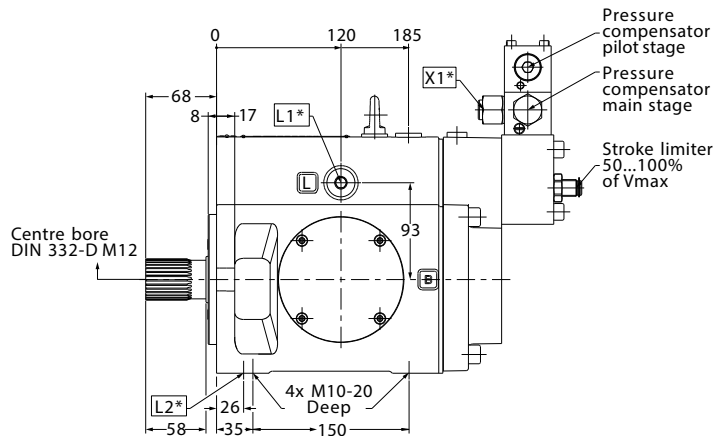
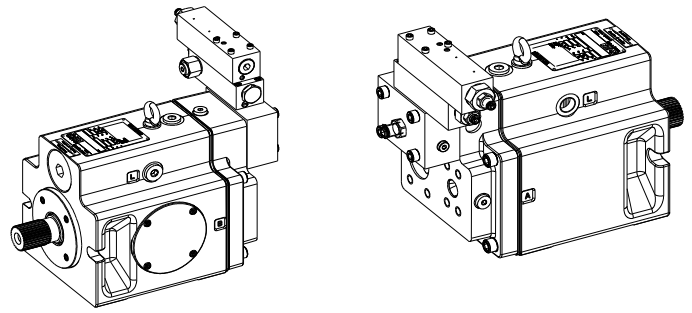
- L3** – Oil filling 7/8" - 14 UNF or Bleed plug
- MA** – Gauge port system pressure G1/4"
- X1** – Remote port pressure compensator G 1/4"-12.5 Deep
- ...*** Connection with plug

Pump dimensions

PVXS-090

Options illustrated:

- 16 = **1** (A & B ports SAE, metric Thread)
- 17 = **A** (A & B ports axial)
- 18 19 = **02** (Splined shaft)
- 22 = **0** (no position indicator)
- 24 25 = **DF** control (pressure compensator)



- A** - System pressure port ISO 6162-2 P25M (SAE J518 CODE 62-1" - 6000 PSI)
- B** - Inlet port ISO 6162-1 P51M (SAE J518 CODE 61 - 2" 3000 PSI)
- L1** - Drain port M22x1.5 (According to mounting position use upper port)
- L2** - M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to **L1** if the pump is installed with the shaft input end pointing upwards.

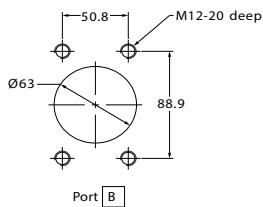
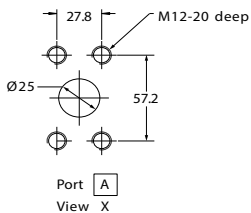
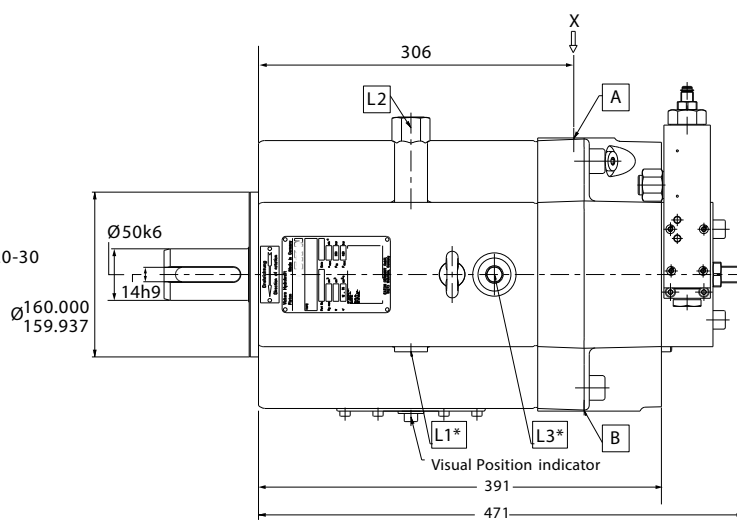
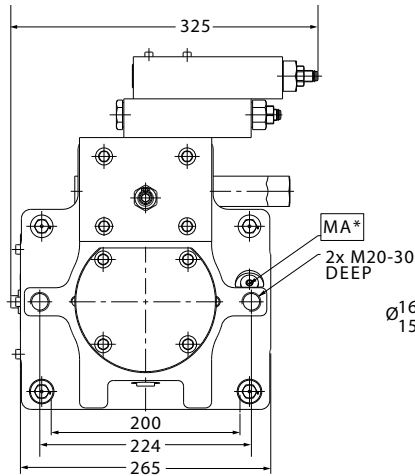
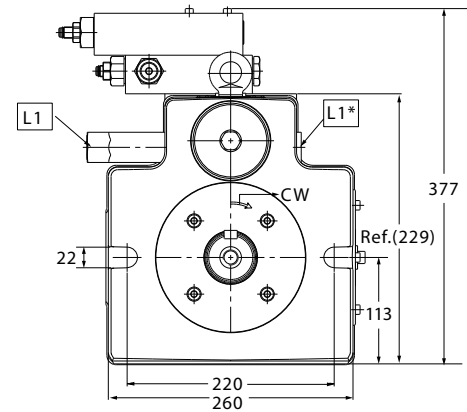
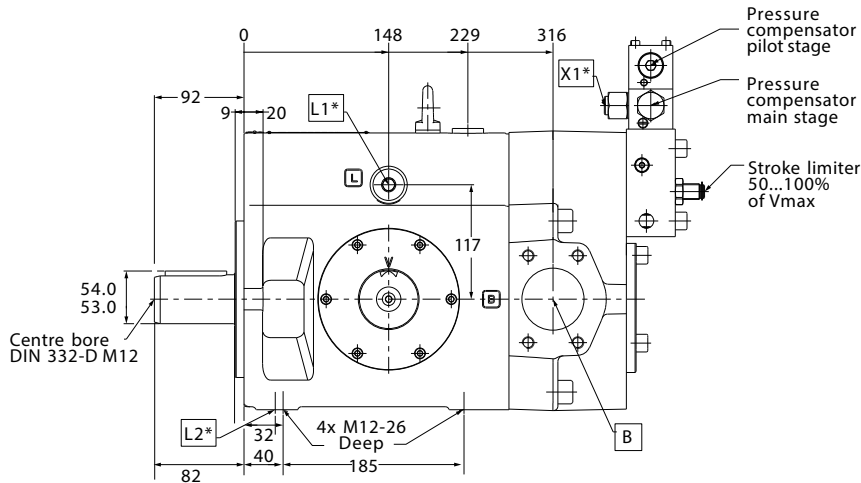
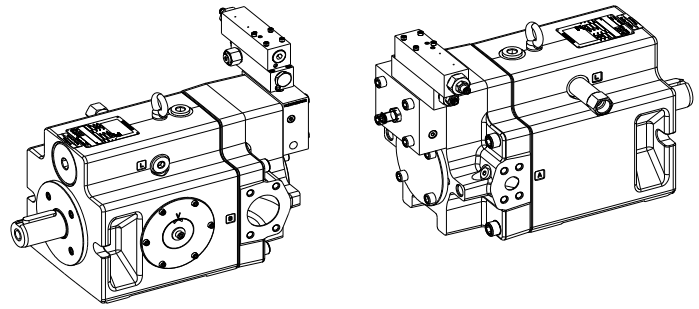
- L3** - Oil filling 7/8" - 14 UNF or Bleed plug
- MA** - Gauge port system pressure G1/4"
- X1** - Remote port pressure compensator G 1/4" - 12.5 Deep
- ...* - Connection with plug

Pump dimensions

PVXS-130

Options illustrated:

- 16** = **1** (A & B ports SAE, metric Thread)
- 17** = **R** (A & B ports radial)
- 18/19** = **01** (ISO keyed shaft)
- 22** = **V** (visual indicator)
- 24/25** = **DF** control (pressure compensator)



- A** – System pressure port ISO 6162-2 P25M (SAE J518 CODE 62-1" - 6000 PSI)
- B** – Inlet port ISO 6162-1 P64M (SAE J518 CODE 61 - 2 1/2" 500 PSI)
- L1** – Drain port M26x1.5 (According to mounting position use upper port)
- L2** – M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to **L1** if the pumps installed with the shaft input end pointing upwards.

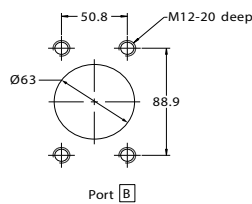
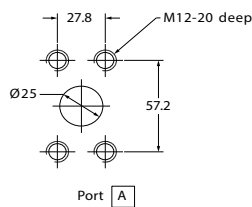
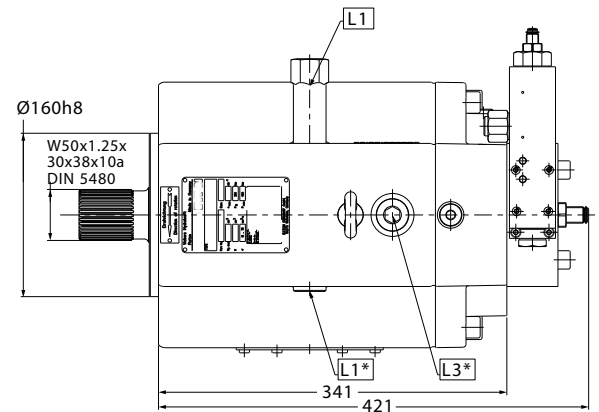
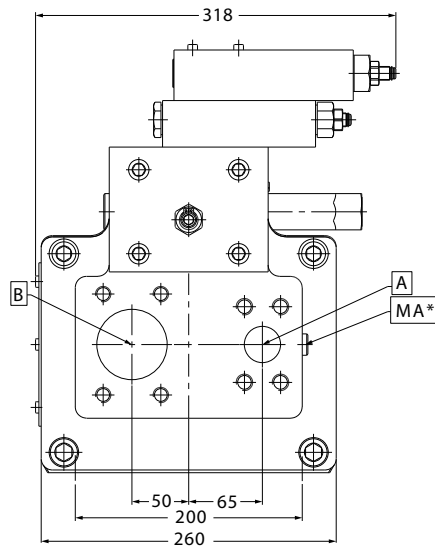
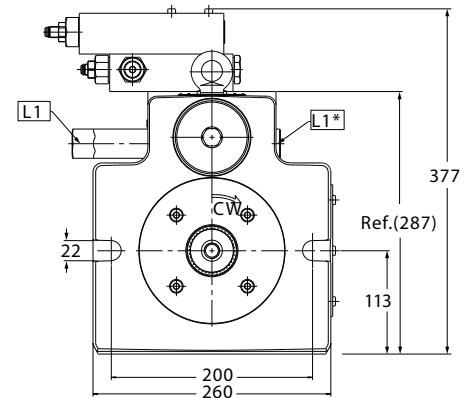
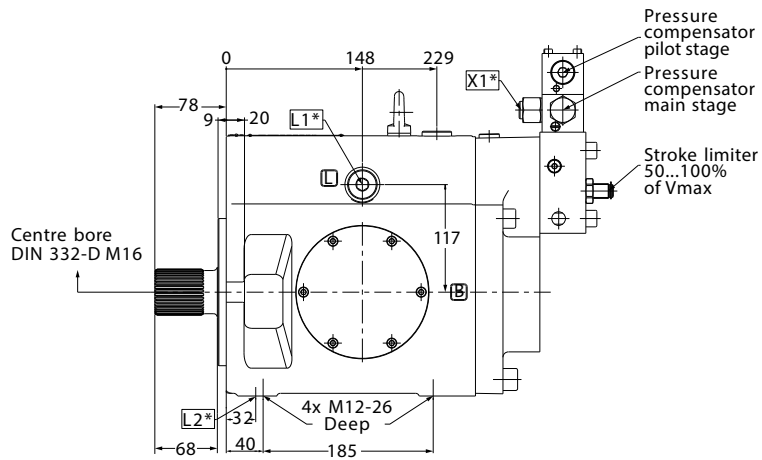
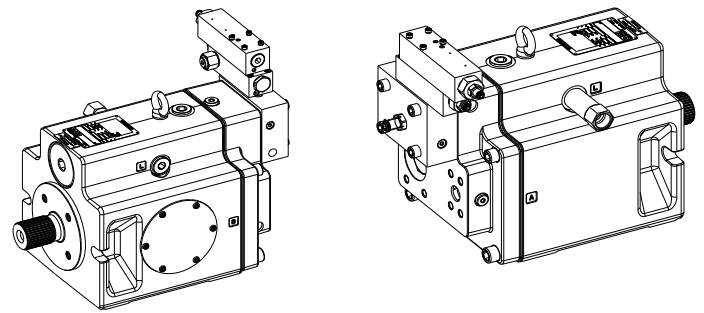
- L3** – Oil filling 1 1/16" - 14 UNF or Bleed plug
- MA** – Gauge port system pressure G1/4"
- X1** – Remote port pressure compensator G 1/4"-12.5 Deep
- ...* – Connection with plug

Pump dimensions

PVXS-130

Options illustrated:

- 16** = **1** (A & B ports SAE, metric Thread)
- 17** = **A** (A & B ports axial)
- 18** **19** = **02** (Splined shaft)
- 22** = **0** (no position indicator)
- 24** **25** = **DF** control (pressure compensator)



- A** - System pressure port ISO 6162-2 P25M (SAE J518 CODE 62-1" - 6000 PSI)
- B** - Inlet port ISO 6162-1 P64M (SAE J518 CODE 61 - 2 1/2" 500 PSI)
- L1** - Drain port M26x1.5 (According to mounting position use upper port)
- L2** - M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to **L1** if the pump is installed with the shaft input end pointing upwards.

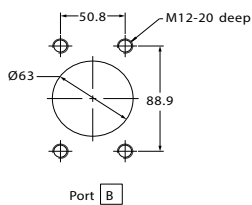
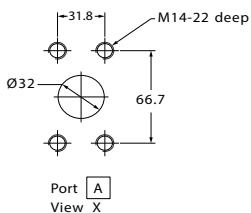
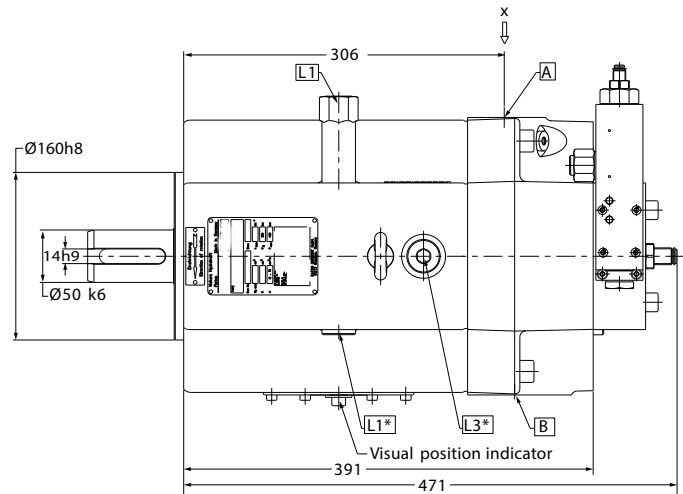
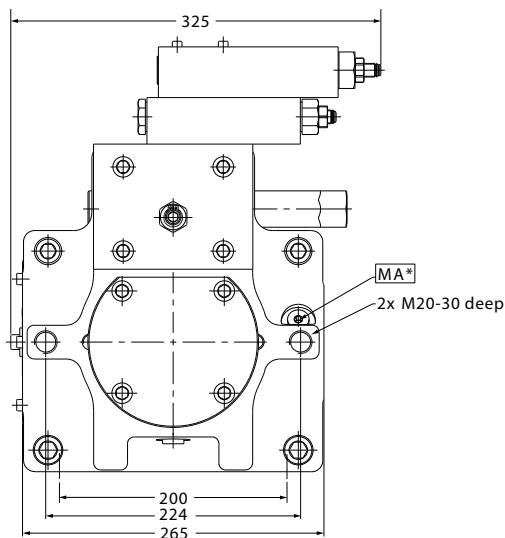
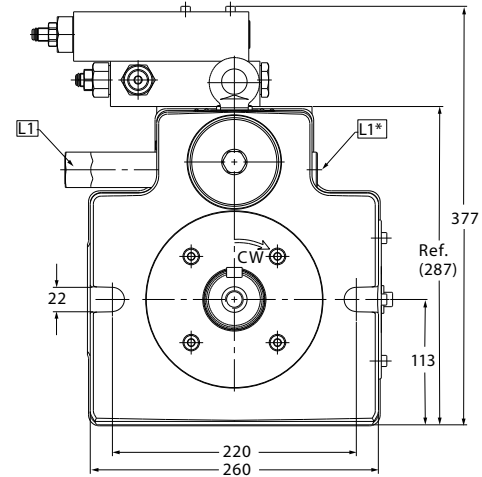
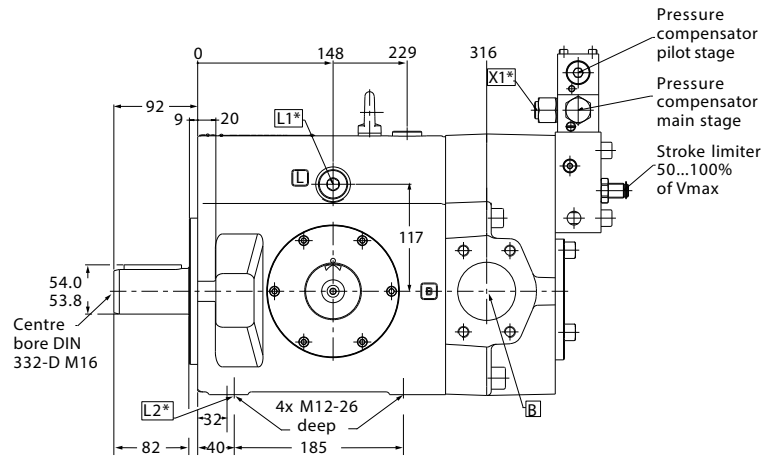
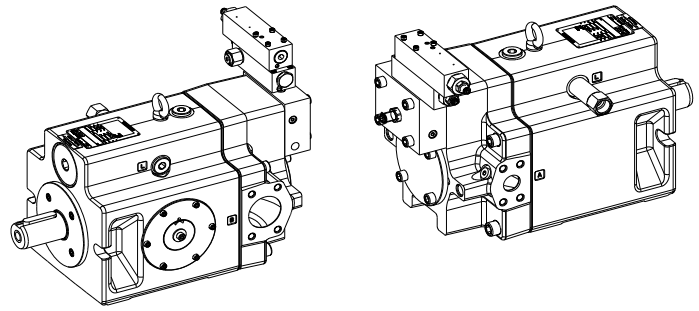
- L3** - Oil filling 1 1/16" - 14 UNF or Bleed plug
- MA** - Gauge port system pressure G1/4"
- X1** - Remote port pressure compensator G 1/4"-12.5 Deep
- ...* - Connection with plug

Pump dimensions

PVXS-180

Options illustrated:

- 16** = **1** (A & B ports SAE, metric Thread)
- 17** = **R** (A & B ports radial)
- 18/19** = **01** (ISO keyed shaft)
- 22** = **V** (visual indicator)
- 24/25** = **DF** control (pressure compensator)



- A** – System pressure port ISO 6162-2 P32M (SAE J518 CODE 62-1 1/4" - 6000 PSI)
- B** – Inlet port ISO 6162-1 P64M (SAE J518 CODE 61 - 2 1/2" 500 PSI)
- L1** – Drain port M26x1.5 (According to mounting position use upper port)
- L2** – M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to **L1** if the pumps installed with the shaft input end pointing upwards.

- L3** – Oil filling 1 1/16" - 14 UNF or Bleed plug
- MA** – Gauge port system pressure G1/4"
- X1** – Remote port pressure compensator G 1/4"-12.5 Deep
- ...*** Connection with plug

Pump dimensions

PVXS-180

Options illustrated:

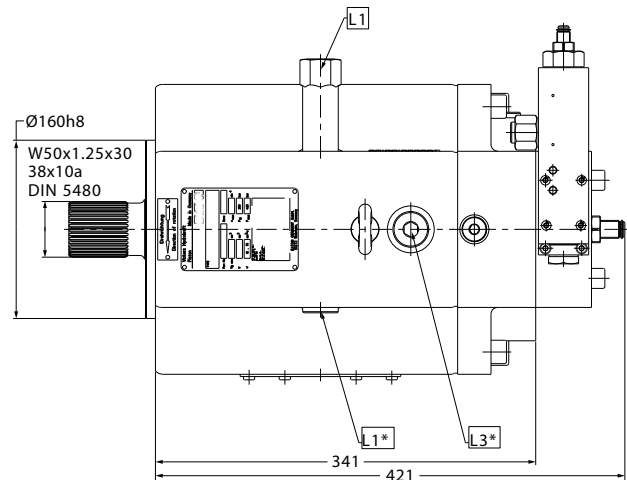
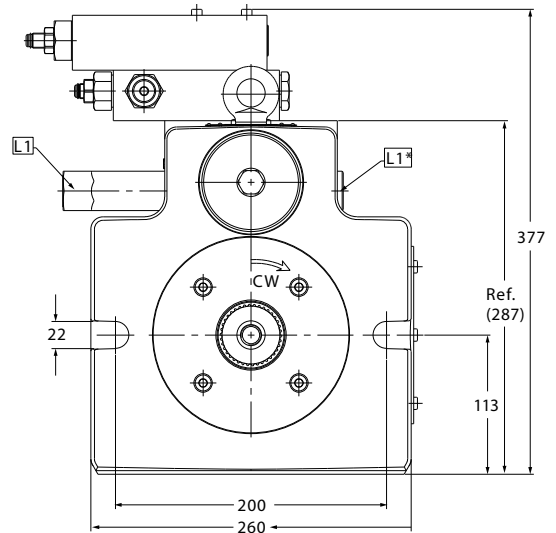
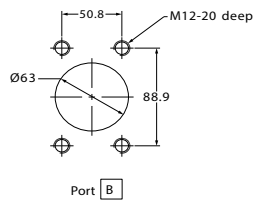
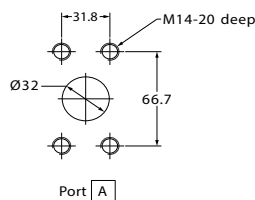
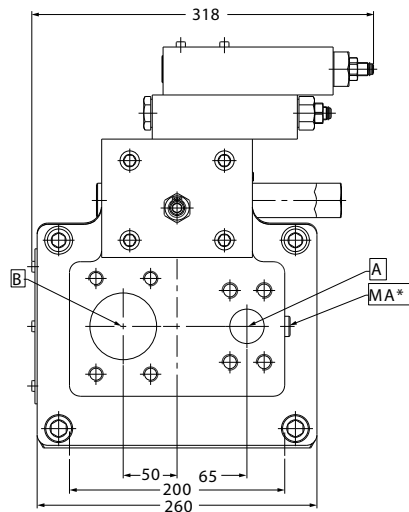
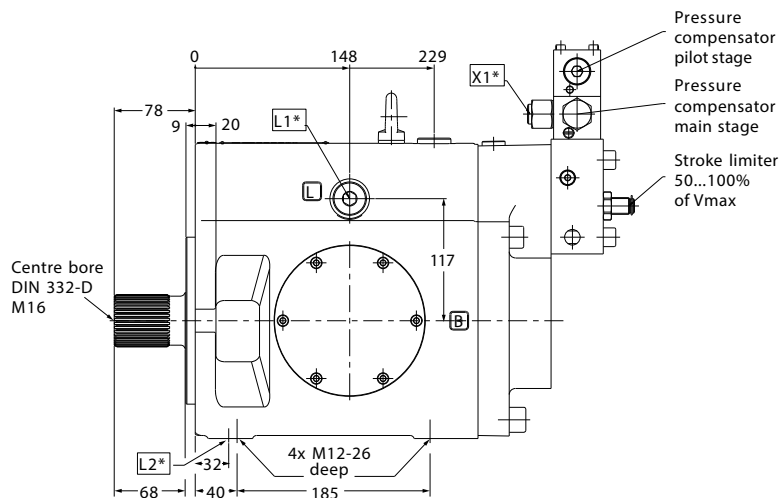
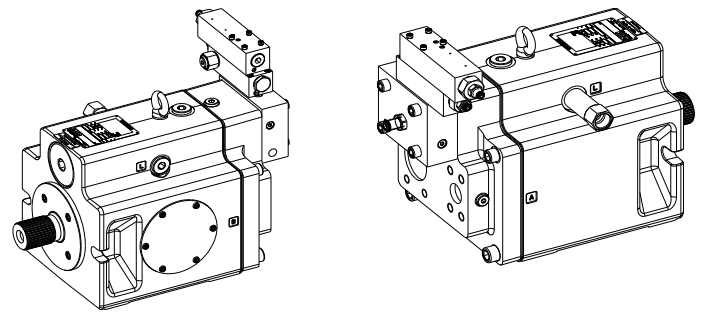
16 = 1 (A & B ports SAE, metric Thread)

17 = A (A & B ports axial)

18 19 = 02 (Splined shaft)

22 = 0 (no position indicator)

24 25 = DF control (pressure compensator)



- A** - System pressure port ISO 6162-2 P32M (SAE J518 CODE 62-1 1/4" - 6000 PSI)
- B** - Inlet port ISO 6162-1 P64M (SAE J518 CODE 61 - 2 1/2" 500 PSI)
- L1** - Drain port M26x1.5 (According to mounting position use upper port)
- L2** - M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to L1 if the pump is installed with the shaft input end pointing upwards.

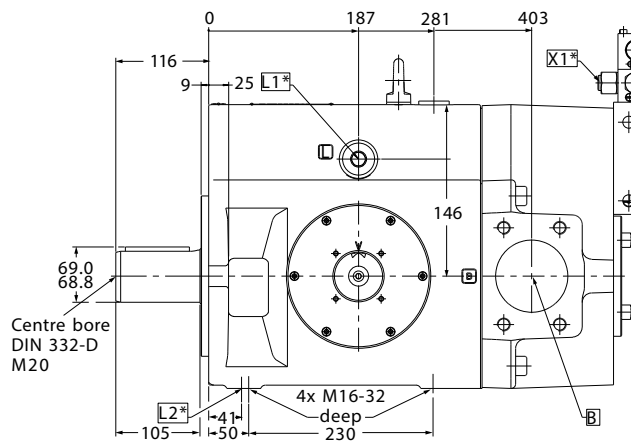
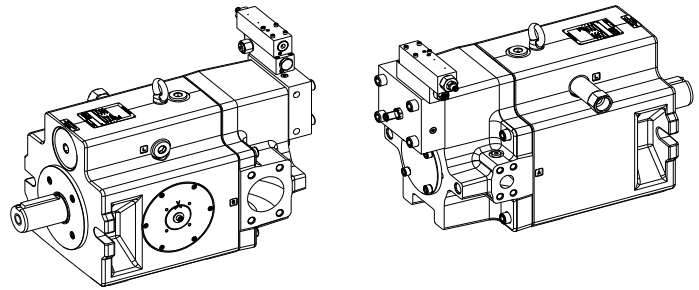
- L3** - Oil filling 1 1/16" - 14 UNF or Bleed plug
- MA** - Gauge port system pressure G1/4"
- X1** - Remote port pressure compensator G 1/4" - 12.5 Deep
- ...* Connection with plug

Pump dimensions

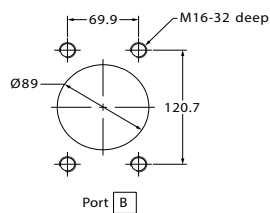
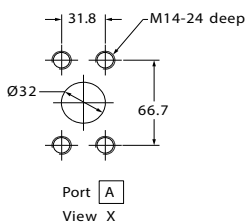
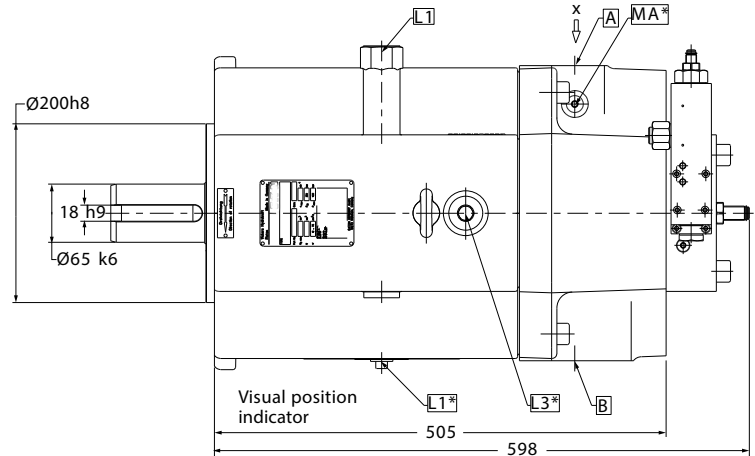
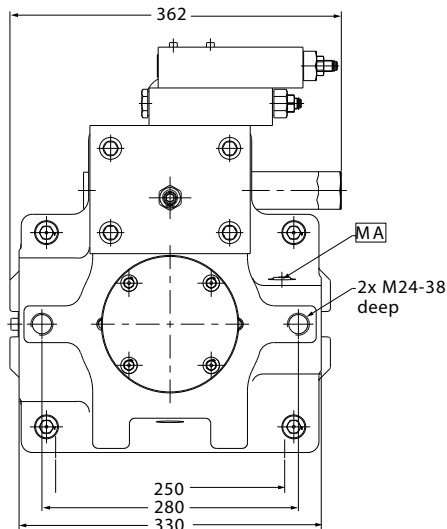
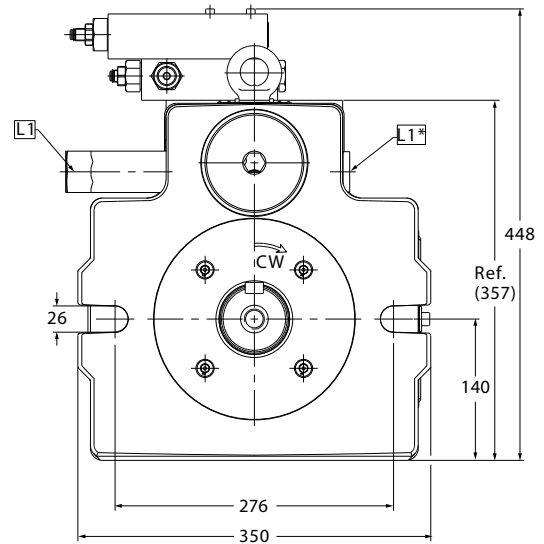
PVXS-250

Options illustrated:

- 16** = **1** (A & B ports SAE, metric Thread)
- 17** = **R** (A & B ports radial)
- 18/19** = **01** (ISO keyed shaft)
- 22** = **V** (visual indicator)
- 24/25** = **DF** control (pressure compensator)



Pressure compensator pilot stage
Pressure compensator main stage
Stroke limiter 50...100% of Vmax



- A** - System pressure port ISO 6162-2 P32M (SAE J518 CODE 62-1 1/4" - 6000 PSI)
- B** - Inlet port ISO 6162-1 P89M (SAE J518 CODE 61 - 3 1/2" 500 PSI)
- L1** - Drain port M33x2 (According to mounting position use upper port)
- L2** - M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to L1 if the pump is installed with the shaft input end pointing upwards.

- L3** - Oil filling 1 5/16" - 14 UNF or Bleed plug
- MA** - Gauge port system pressure G1/4"
- X1** - Remote port pressure compensator G 1/4" - 12.5 Deep
- ...*** - Connection with plug

Pump dimensions

PVXS-250

Options illustrated:

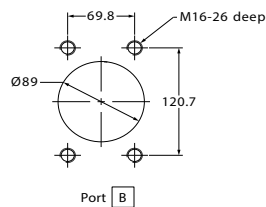
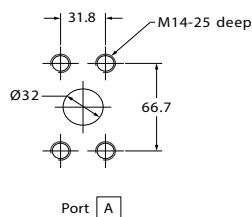
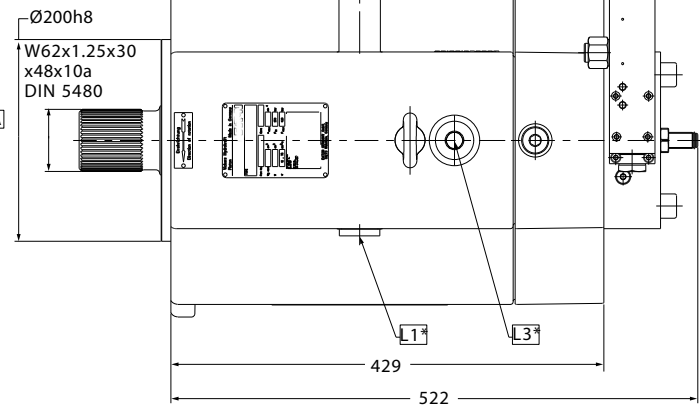
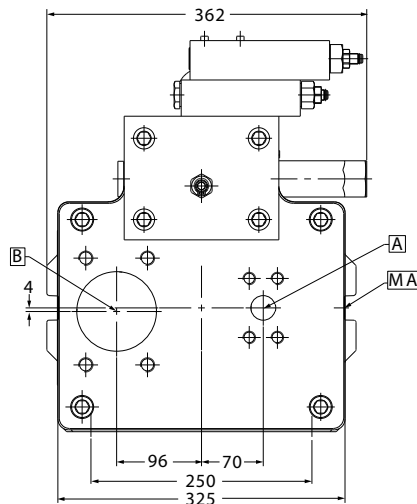
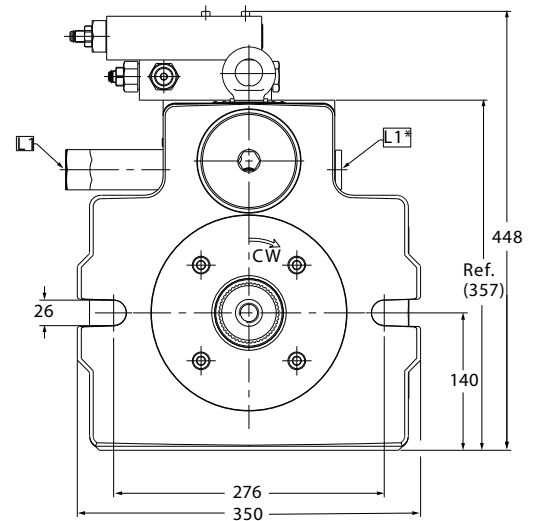
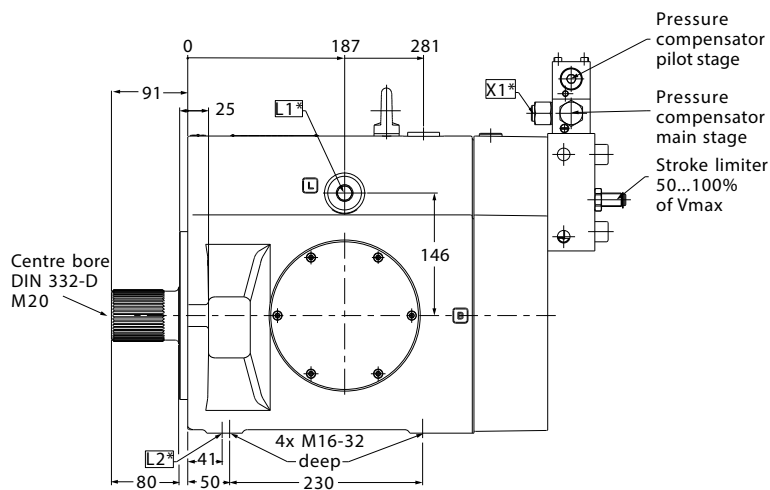
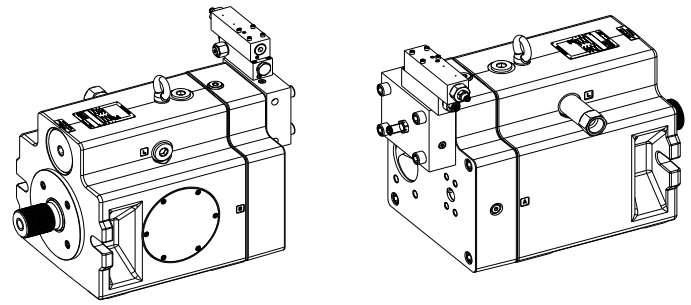
16 = **1** (A & B ports SAE, metric Thread)

17 = **A** (A & B ports axial)

18 19 = **02** (Splined shaft)

22 = **0** (no position indicator)

24 25 = **DF** control (pressure compensator)



- A** - System pressure port ISO 6162-2 P32M (SAE J518 CODE 62-1 1/4" - 6000 PSI)
- B** - Inlet port ISO 6162-1 P89M (SAE J518 CODE 61 - 3 1/2" 500 PSI)
- L1** - Drain port M33x2 (According to mounting position use upper port)
- L2** - M18x1.5-12 Deep supplementary drain or bleed plug. Must be drained in addition to **L1** if the pump is installed with the shaft input end pointing upwards.

- L3** - Oil filling 1 5/16" - 14 UNF or Bleed plug
- MA** - Gauge port system pressure G1/4"
- X1** - Remote port pressure compensator G 1/4"-12.5 Deep
- ...* - Connection with plug

Control Options DF

General Description

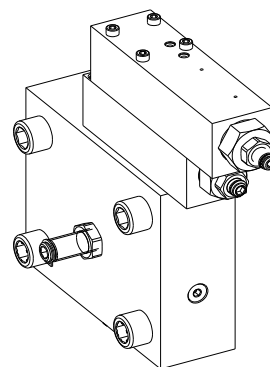
Energy-saving hydraulic drives are possible with pressure compensated and/or power controlled pumps, especially in combination with the Load sensing option.

Control options DF

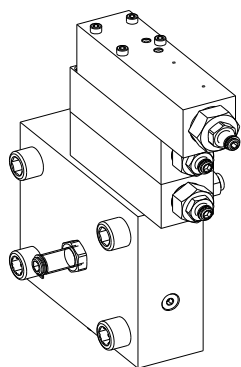
System pressure remains constant for the entire volume

flow rate. System pressure can be set manually, hydraulically or electronically.

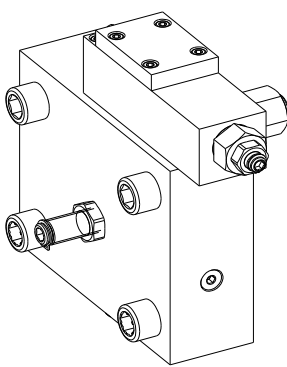
The standard Hydrocraft pressure compensator is pilot operated, has a remote port and is very stable.



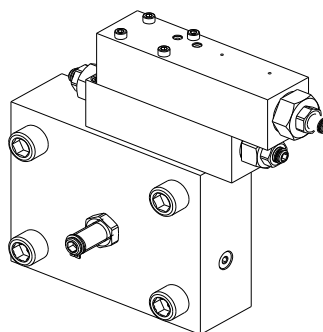
DF000A00



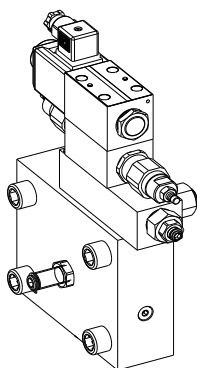
DF000A010



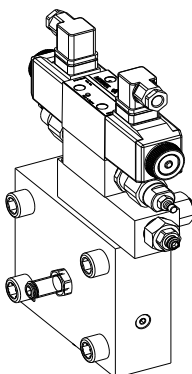
DF000A0F



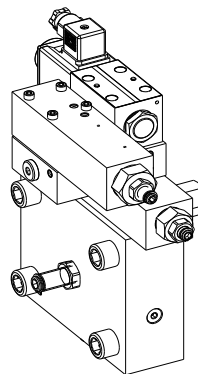
DF000A0S



DF000AA

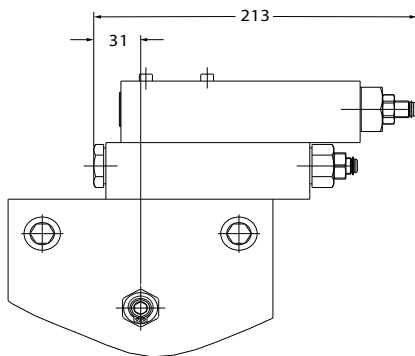
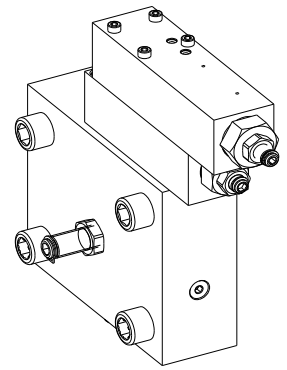


DF000AB

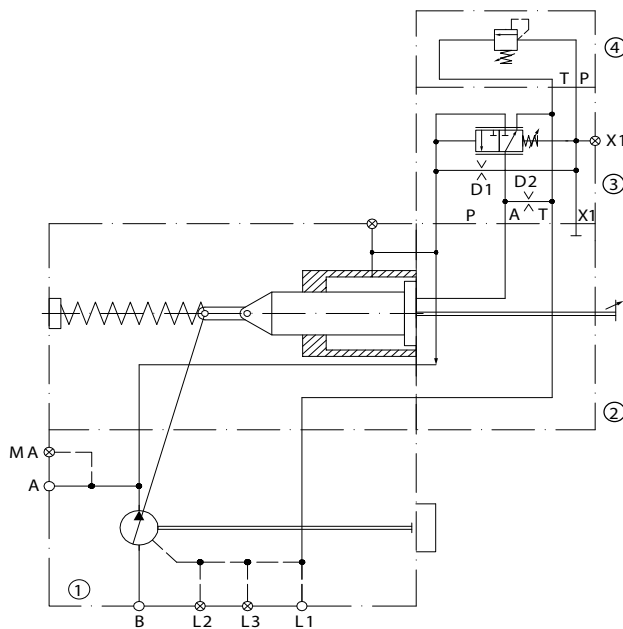
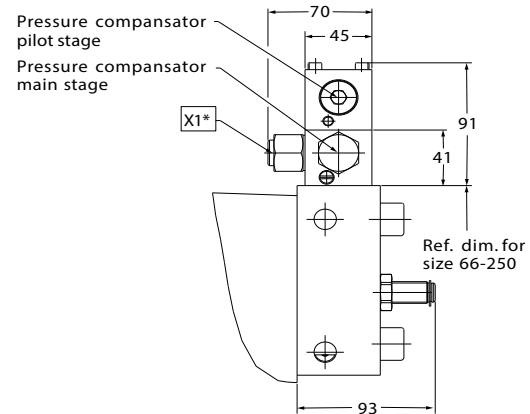


DF000A0_100H

Control Options DF A0

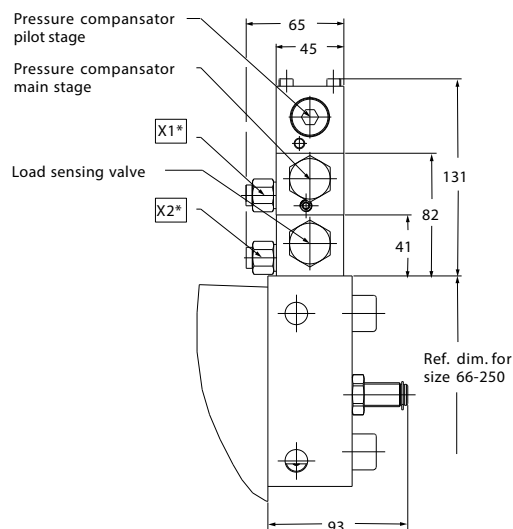
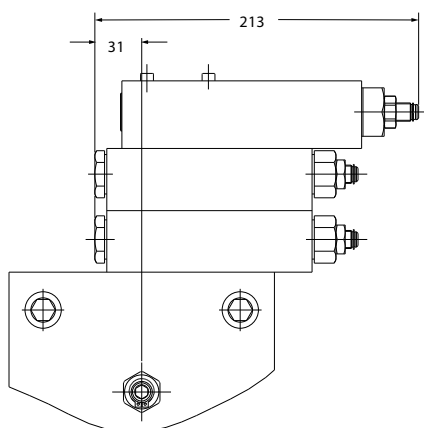
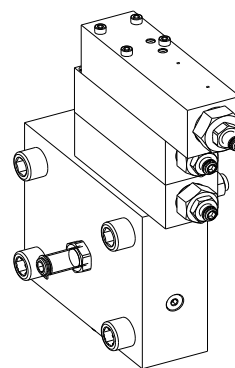


- X1** Remote port pressure compensator. G 1/4"-12.5 DEEP
...* Connection with plug.

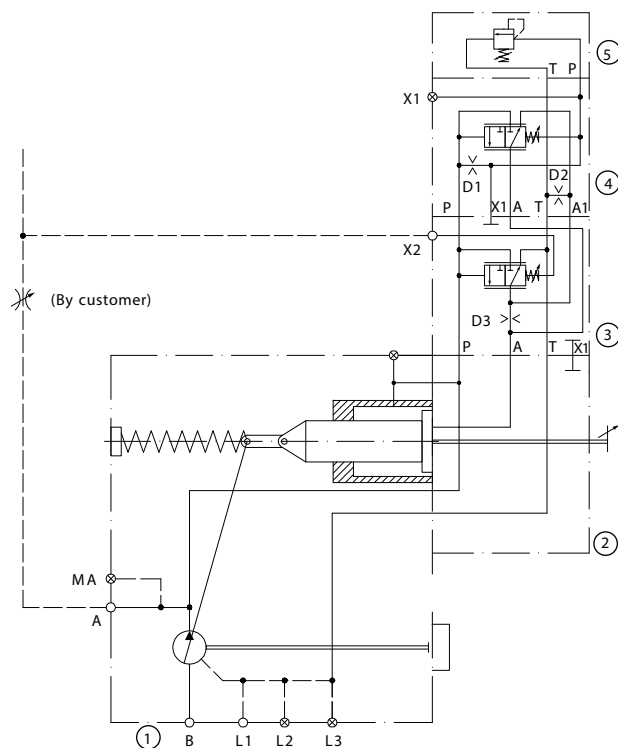


- A** - System port
 - B** - Inlet port
 - L1, L2** - Drain port
 - L3** - Oil filling plug
 - MA** - Gauge port-system pressure
 - X1** - Remote port pressure compensator
-
- 1** - Basic pump
 - 2** - Connection plate for DF-control
 - 3** - Pressure compensator, main stage
 - 4** - Pressure compensator, pilot stage

Control Options DF A10

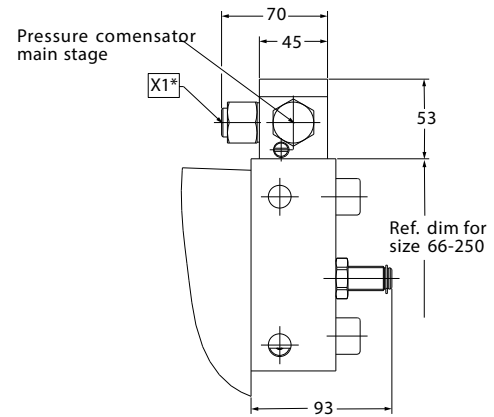
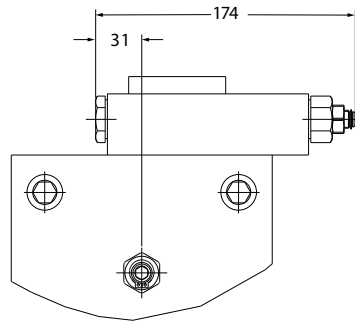
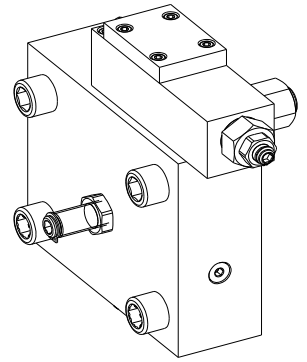


- X1 Remote port pressure compensator. G 1/8"-12.5 DEEP
- X2 Remote port load sensing. G 1/8"
- ...* Connection with plug.

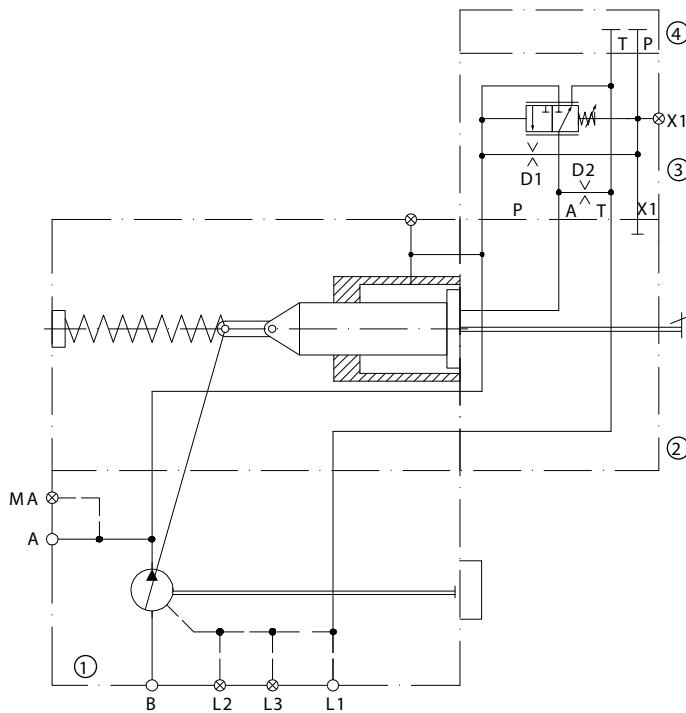


- A** - System port
- B** - Inlet port
- L1, L2** - Drain port
- L3** - Oil filling plug
- MA** - Gauge port-system pressure
- X1** - Remote port pressure compensator
- X2** - Remote port load sense
- 1** - Basic pump
- 2** - Connection plate for DF-control
- 3** - Pressure compensator-load sense stage
- 4** - Pressure compensator main stage
- 5** - Pressure compensator pilot stage

Control Options DF A0F

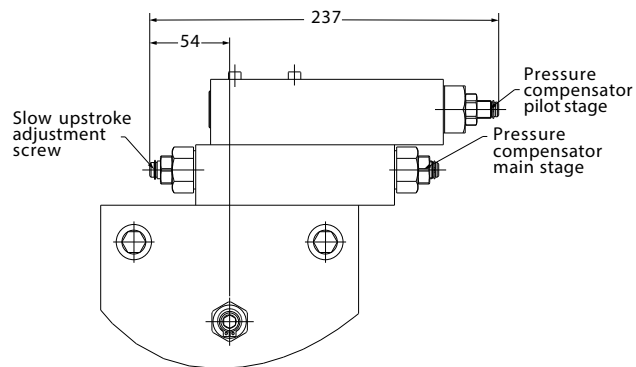
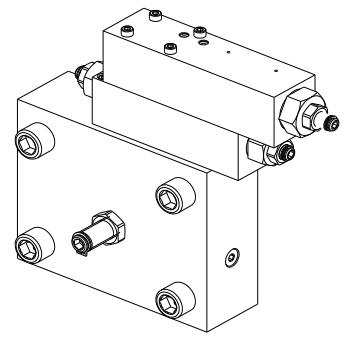


- X1** Remote port pressure compensator. G 1/4"-12.5 DEEP
...* Connection with plug.

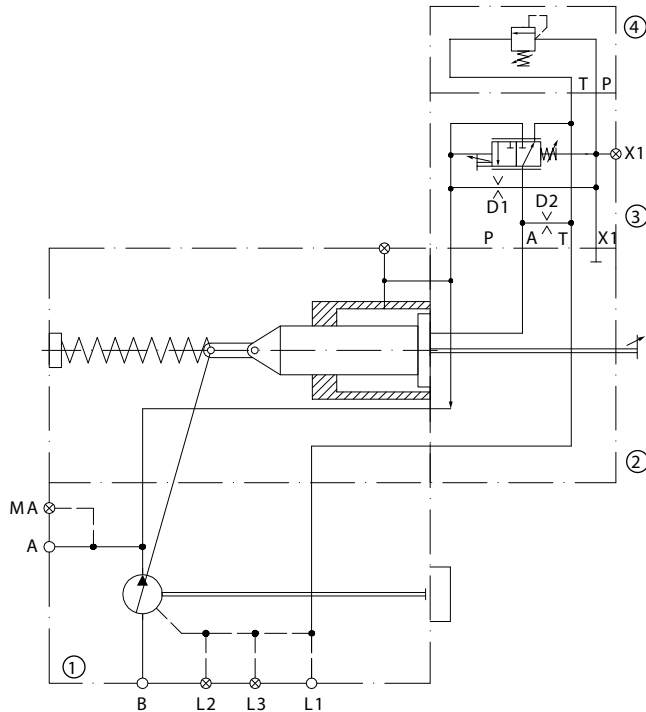
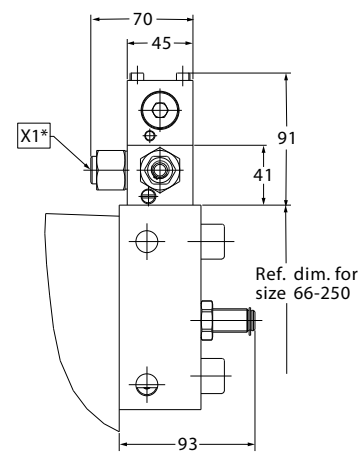


- A** - System port
- B** - Inlet port
- L1, L2** - Drain port
- L3** - Oil filling plug
- MA** - Gauge port-system pressure
- X1** - Remote port pressure compensator
- 1** - Basic pump
- 2** - Connection plate for DF-control
- 3** - Pressure compensator, main stage
- 4** - Closing plate

Control Options DF A0S

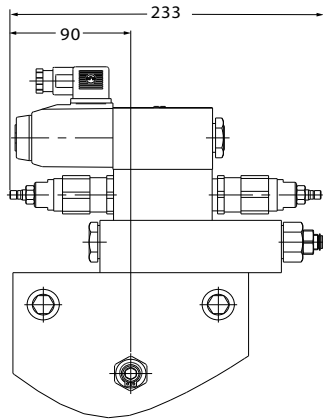
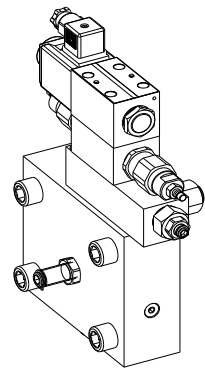


- X1** Remote port pressure compensator. G 1/4"-12.5 DEEP
...* Connection with plug.

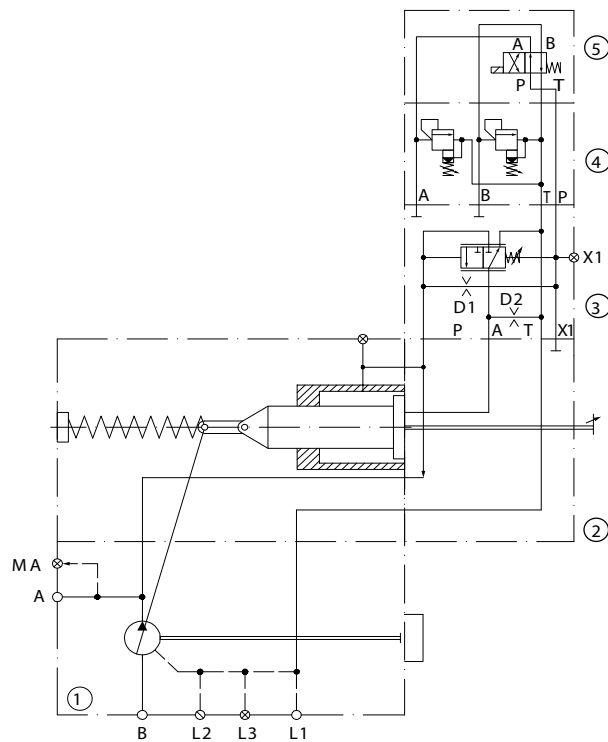
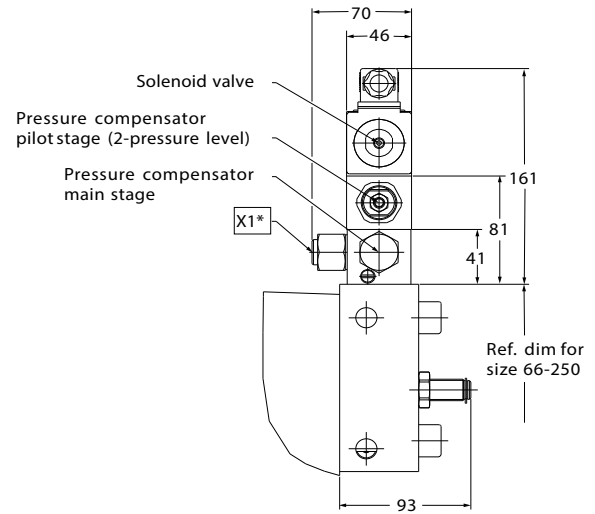


- A** - System port
 - B** - Inlet port
 - L1, L2** - Drain port
 - L3** - Oil filling plug
 - MA** - Gauge port-system pressure
 - X1** - Remote port pressure compensator
-
- 1** - Basic pump
 - 2** - Connection plate for DF-control
 - 3** - Pressure compensator, main stage with slow upstroke adjustment screw
 - 4** - Pressure compensator, pilot stage

Control Options DF AA

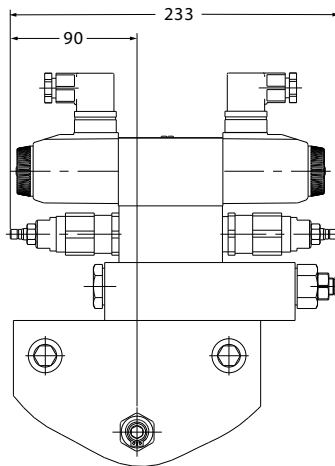
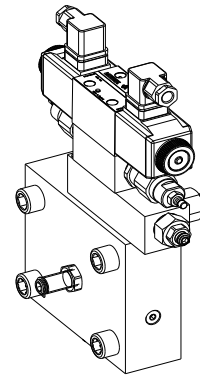


- X1** Remote port pressure compensator. G 1/4"-12.5 DEEP
...* Connection with plug.

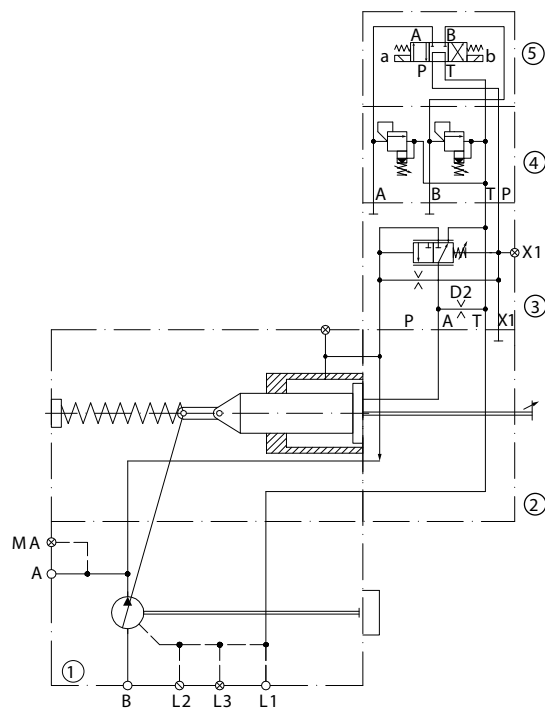
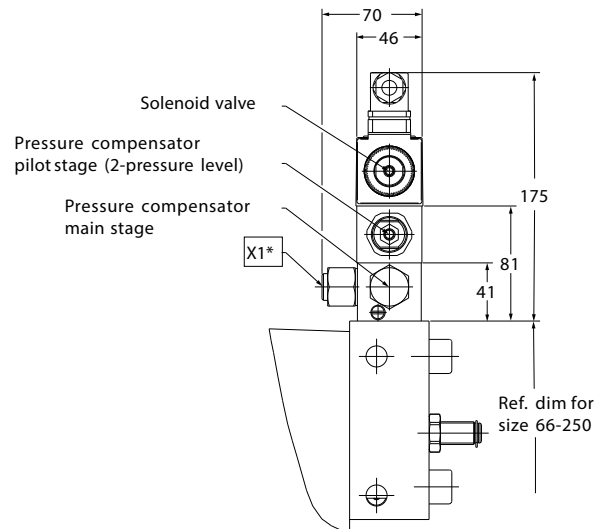


- A** - System port
- B** - Inlet port
- L1, L2** - Drain port
- L3** - Oil filling plug
- MA** - Gauge port-system pressure
- X1** - Remote port pressure compensator
- 1** - Basic pump
- 2** - Connection plate for DF-control
- 3** - Pressure compensator, main stage
- 4** - Pressure compensator, pilot stage (Dual relief function)
- 5** - 4/2 Directional control valve

Control Options DF



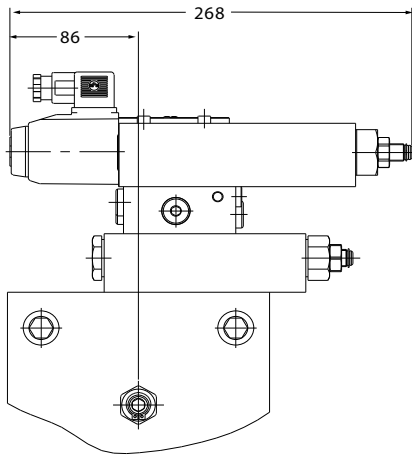
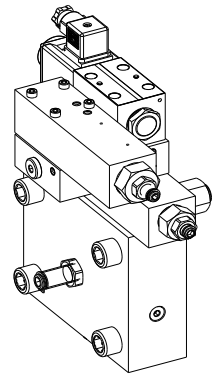
- X1 Remote port pressure compensator. G 1/4"-12.5 DEEP
...* Connection with plug.



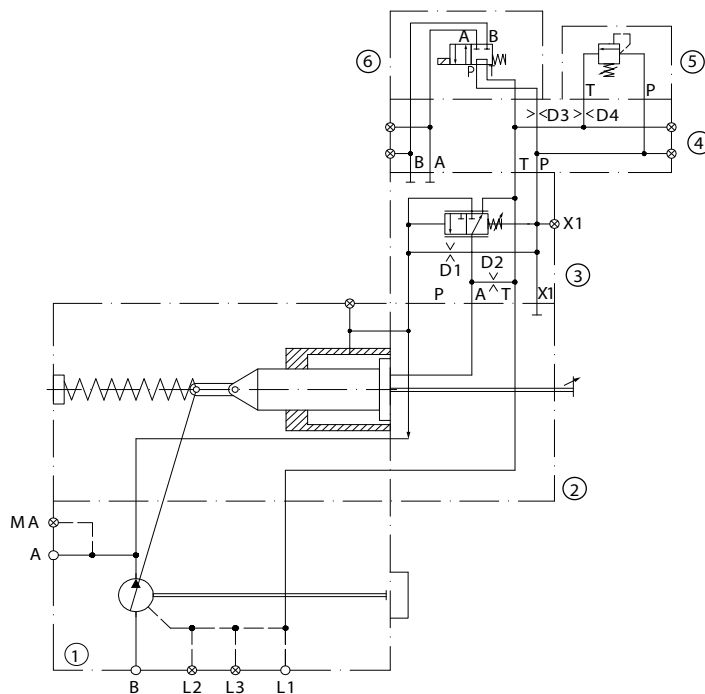
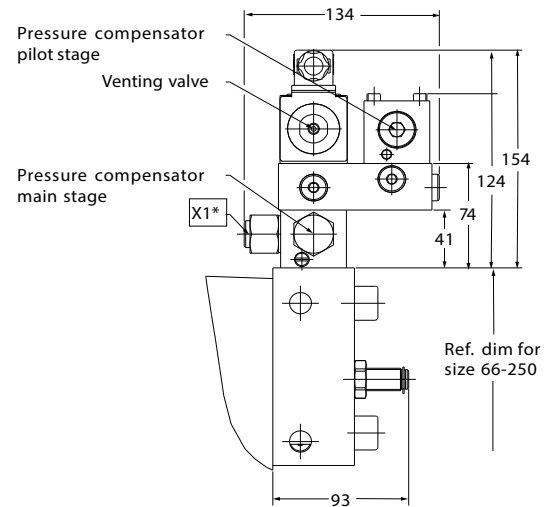
- | | |
|---------------|--|
| A | - Systemport |
| B | - Inlet port |
| L1, L2 | - Drain port |
| L3 | - Oil filling plug |
| MA | - Gauge port-systempressure |
| X1 | - Remote port
pressure compensator |
| 1 | - Basic pump |
| 2 | - Connection plate for DF-control |
| 3 | - Pressure compensator
main stage |
| 4 | - Pressure compensator
pilot stage (Dual relief function) |
| 5 | - 4/3 Directional control valve |

Control Options DF

A0_____100H



- X1** Remote port pressure compensator. G 1/4"-12.5 DEEP
...* Connection with plug.



- A** - System port
 - B** - Inlet port
 - L1, L2** - Drain port
 - L3** - Oil filling plug
 - MA** - Gauge port-system pressure
 - X1** - Remote port pressure compensator
- 1** - Basic pump
 - 2** - Connection plate for DF-control
 - 3** - Pressure compensator, main stage
 - 4** - Intermediate plate
 - 5** - Pressure compensator, pilot stage
 - 6** - Venting valve

Control Options LR

General Description

Energy-saving hydraulic drives are possible with pressure compensated and/or power controlled pumps, especially in combination with the loadsensing option.

LR controls

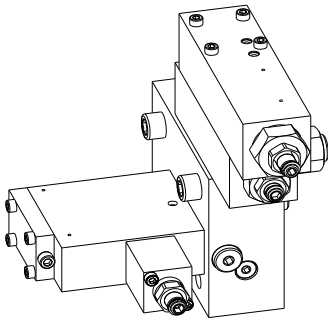
The typical p/Q curve is a hyperbola. For constant speed, the drive torque, i.e. the power used, is held constant.

The power hyperbola can be continuously adjusted between P_{min} and P_{max} , P_{min} is given by the minimum setting of the control main stage (20bar approx.) and power loss of the pump.

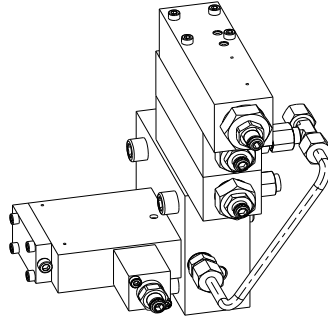
Both controller types can be combined with another or with additional options; for available options, see Model Code.

Maximum pump flow can be limited mechanically to between 50% and 100% by a screw. As an additional option, maximum (or minimum) flow can also be limited by a spacer inside the control cylinder (Model Code position options **4, 5 or 6**, in combination with customer adjustment specified in positions to).

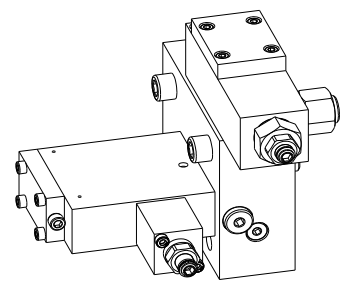
This solution is also recommended for severe operating conditions and the need for high repeatability over a long period of time. The setting must be defined before ordering since it cannot be modified in operation.



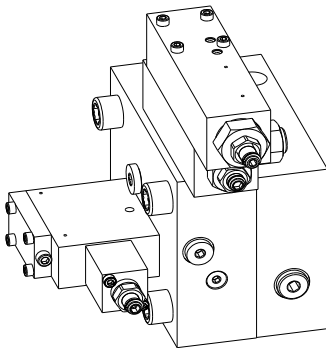
PVX-066-180-LR000A20



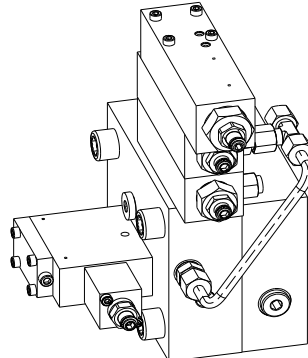
PVX-066-180-LR000A30



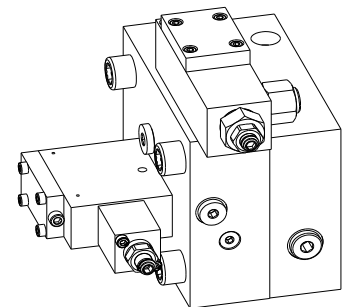
PVX-066-180-LR000A2F



PVX-250-LR000A20



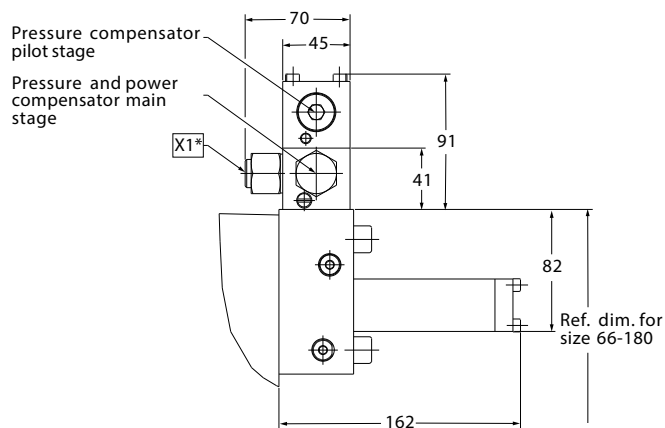
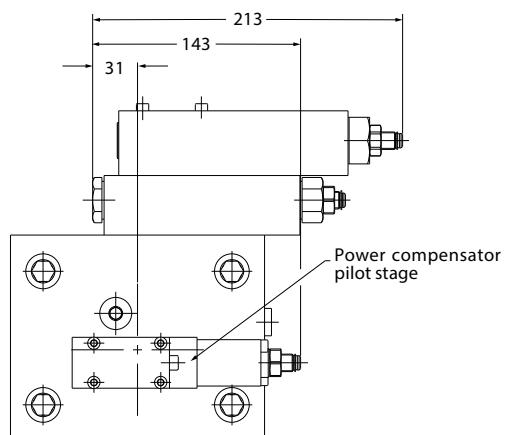
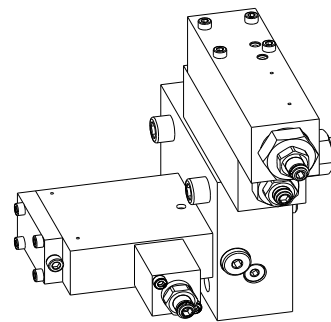
PVX-250-LR000A30



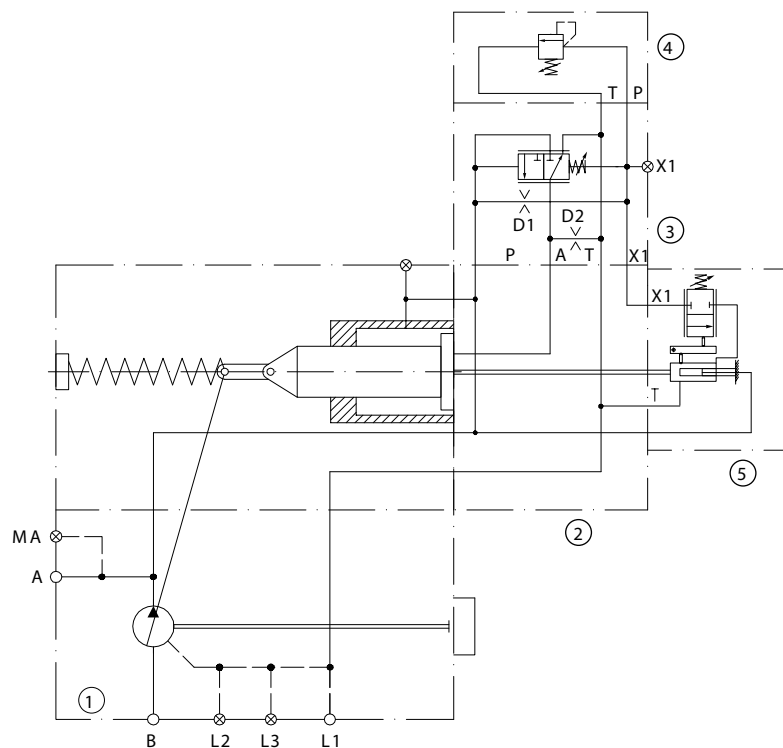
PVX-250-LR000A2F

Control Options LR

A20 size 066-180



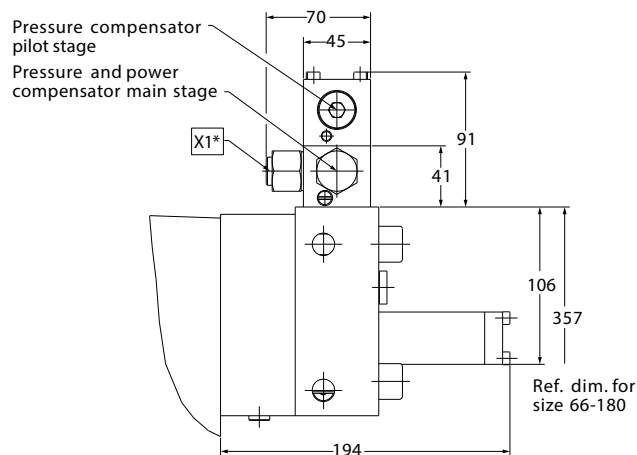
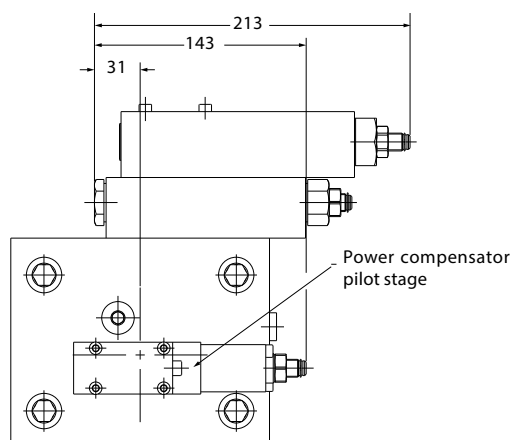
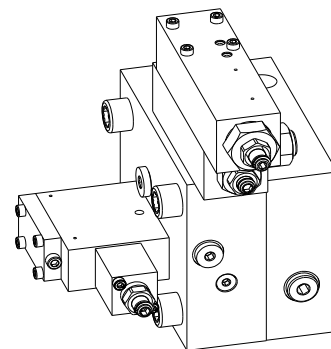
- X1 Remote port pressure compensator. G 1/4"-12.5 DEEP
 ...* Connection with plug.



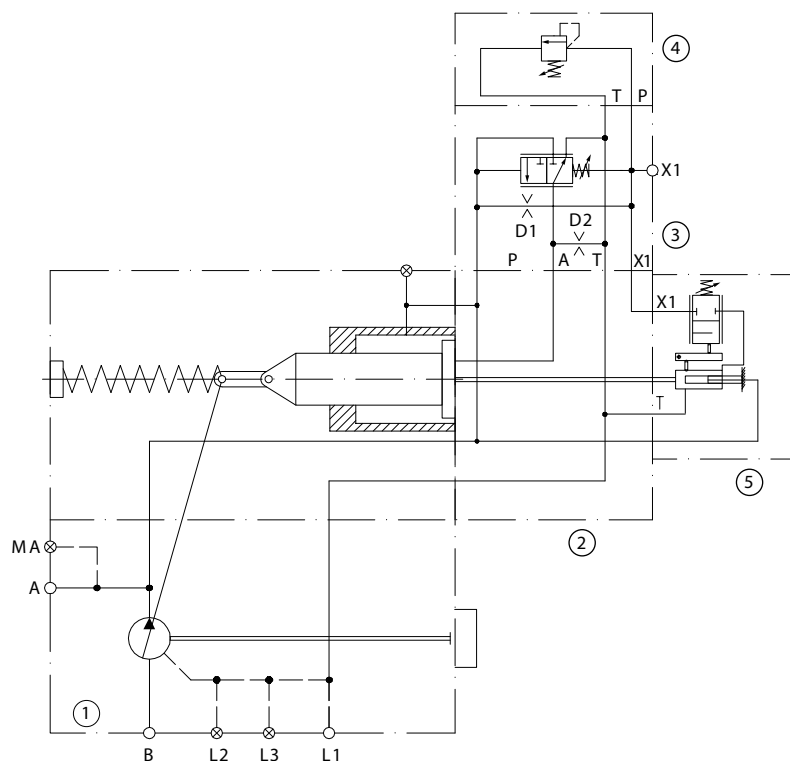
- A** - System port
 - B** - Inlet port
 - L1, L2** - Drain port
 - L3** - Oil filling plug
 - MA** - Gauge port-system pressure
 - X1** - Remote port pressure compensator
-
- 1** - Basic pump
 - 2** - Connection plate for LR-control
 - 3** - Pressure and power compensator main stage
 - 4** - Pressure compensator pilot stage
 - 5** - Power compensator pilot stage

Control Options LR

A20 size 250

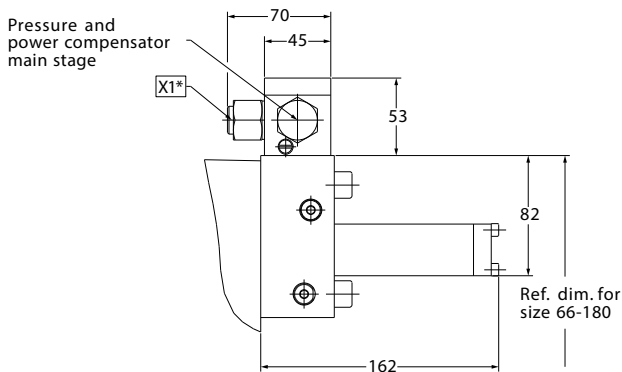
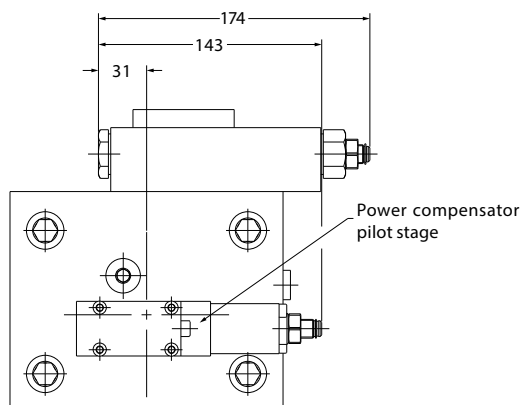
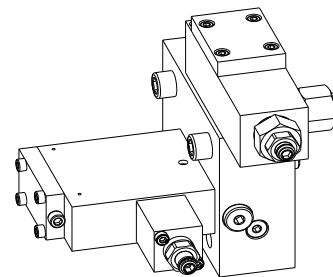


- X1** Remote port pressure compensator. G 1/4"-12.5 DEEP
...* Connection with plug.



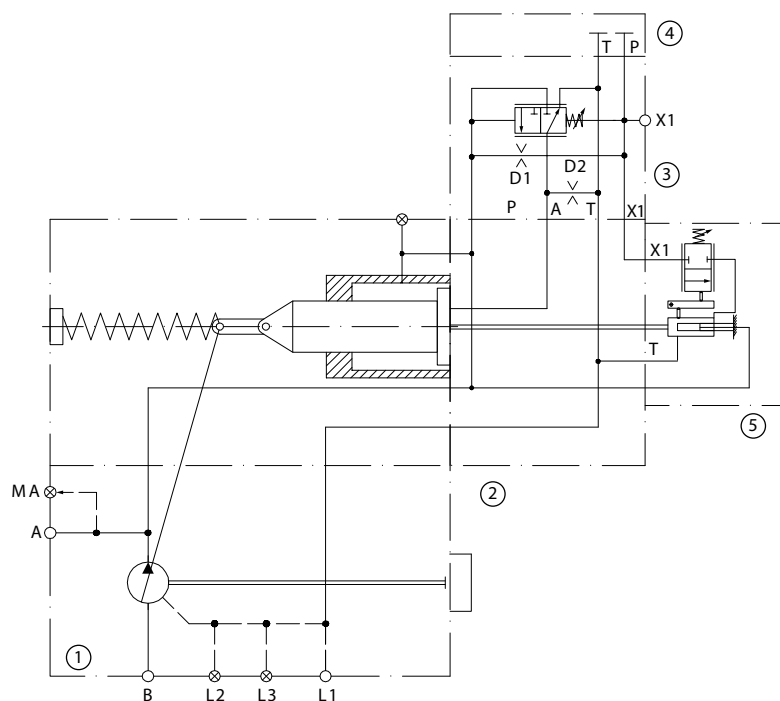
- A** - System port
 - B** - Inlet port
 - L1, L2** - Drain port
 - L3** - Oil filling plug
 - MA** - Gauge port-system pressure
 - X1** - Remote port pressure compensator
- 1** - Basic pump
 - 2** - Connection plate for LR-control
 - 3** - Pressure and power compensator main stage
 - 4** - Pressure compensator pilot stage
 - 5** - Power compensator pilot stage

Control Options LR A2F size 066-180



X1 Remote port pressure compensator. G 1/4"-12.5 DEEP

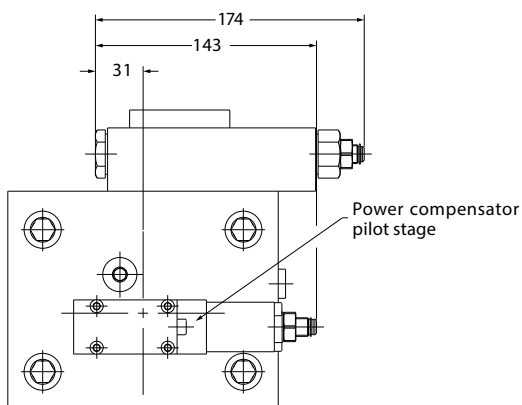
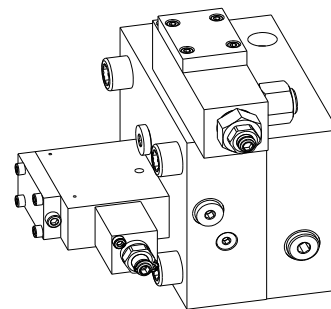
...* Connection with plug.



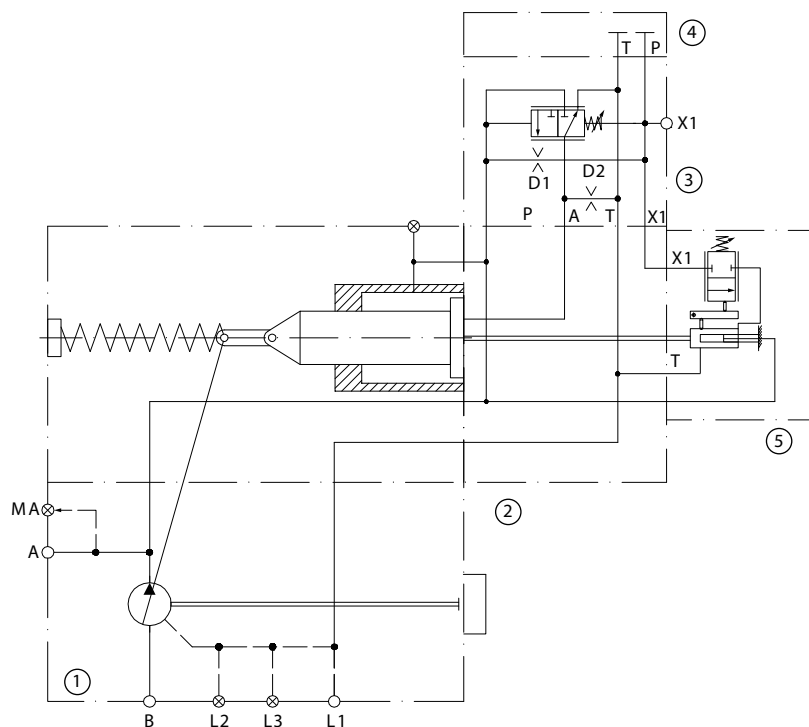
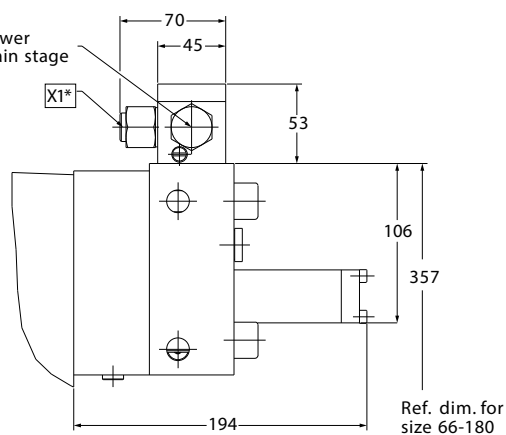
- A** - System port
- B** - Inlet port
- L1, L2** - Drain port
- L3** - Oil filling plug
- MA** - Gauge port-system pressure
- X1** - Remote port pressure compensator
- 1** - Basic pump
- 2** - Connection plate for LR-control
- 3** - Pressure and power compensator main stage
- 4** - Closing plate
- 5** - Power compensator pilot stage

Control Options LR

A2F size 250

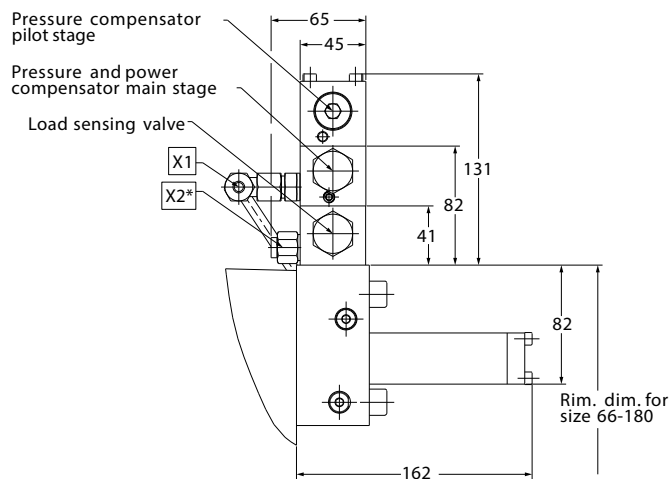
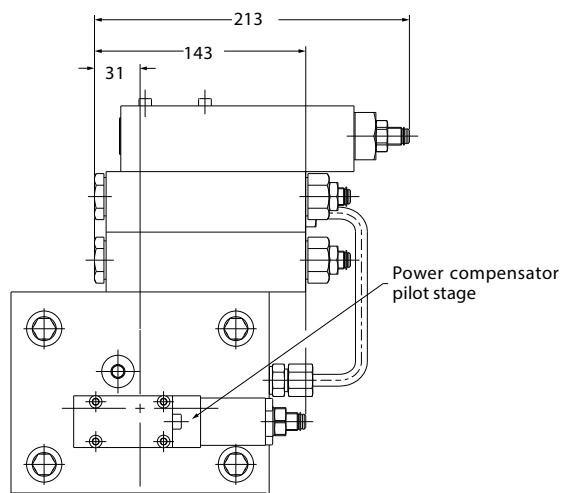
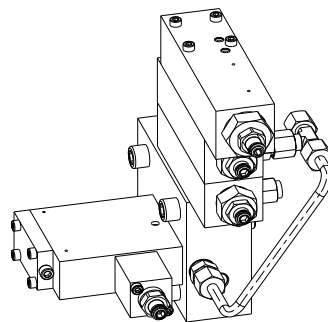


- X1 Remote port pressure compensator. G 1/4"-12.5 DEEP
 ...* Connection with plug.

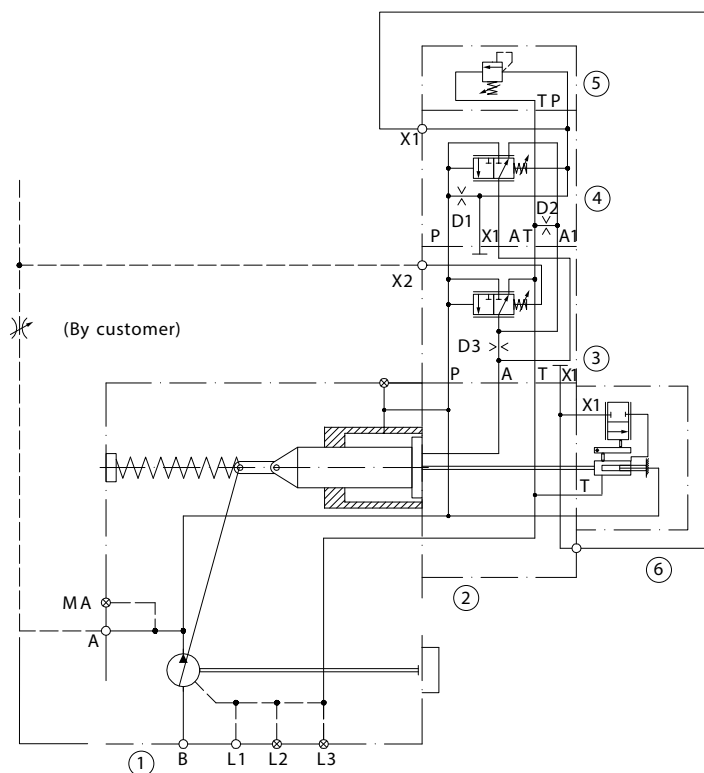


- A** - System port
 - B** - Inlet port
 - L1, L2** - Drain port
 - L3** - Oil filling plug
 - MA** - Gauge port-system pressure
 - X1** - Remote port pressure compensator
- 1** - Basic pump
 - 2** - Connection plate for LR-control
 - 3** - Pressure and power compensator main stage
 - 4** - Closing plate
 - 5** - Power compensator pilot stage

Control Options LR A30 size 066-180



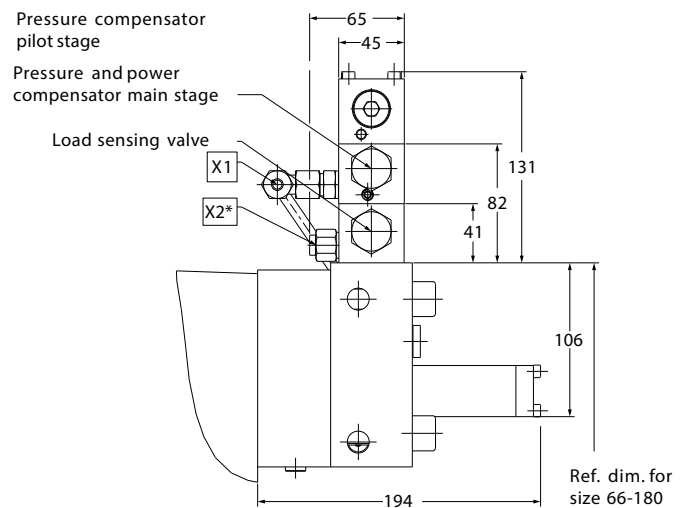
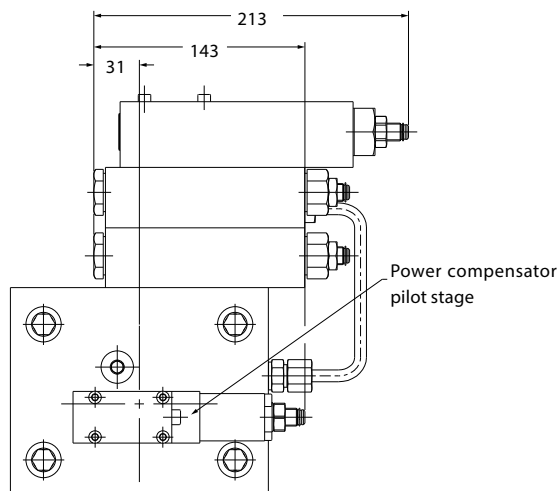
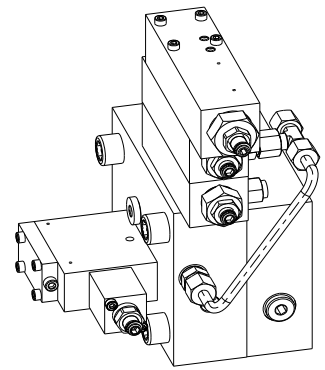
- X1 Remote port pressure compensator 85 ACC. DIN EN ISO 8434-1
- X2 Remote port load sensing. G 1/8"
- ...* Connection with plug.



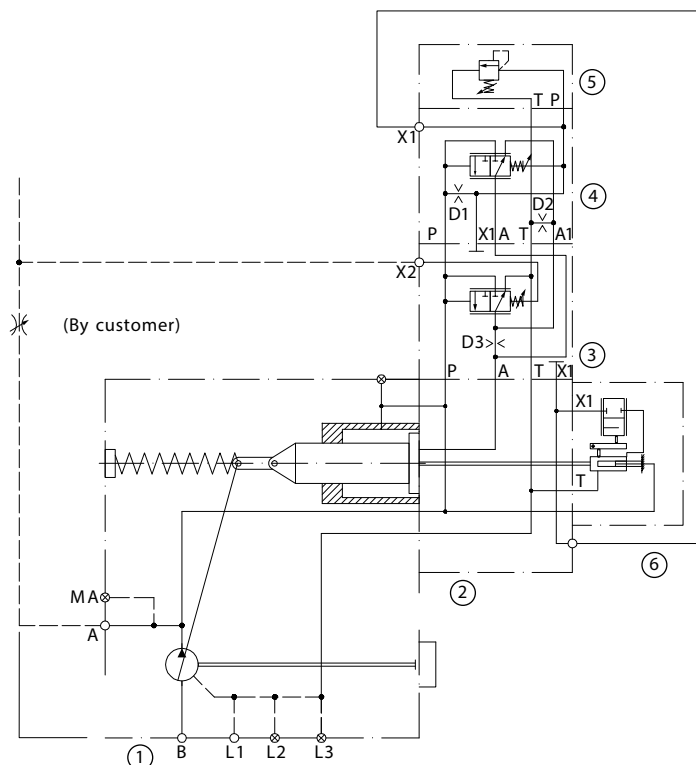
- A** – System port
- B** – Inlet port
- L1, L2** – Drain port
- L3** – Oil filling plug
- MA** – Gauge port-system pressure
- X1** – Remote port pressure compensator
- X2** – Remote port load sense
- 1** – Basic pump
- 2** – Connection plate for LR-control
- 3** – Pressure compensator-load sense stage
- 4** – Pressure and power compensator main stage
- 5** – Pressure compensator pilot stage
- 6** – Power compensator pilot stage

Control Options LR

A30 size 250



- | | |
|------|--|
| X1 | Remote port pressure compensator 8s ACC. DIN EN ISO 8434-1 |
| X2 | Remote port load sensing. G 1/8" |
| ...* | Connection with plug. |



- | | | |
|---------------|---|---|
| A | – | Systemport |
| B | – | Inlet port |
| L1, L2 | – | Drain port |
| L3 | – | Oil filling plug |
| MA | – | Gauge port-systempressure |
| X1 | – | Remote port pressure compensator |
| X2 | – | Remote port load sense |
| 1 | – | Basic pump |
| 2 | – | Connection plate for LR-control |
| 3 | – | Pressure compensator-load sense stage |
| 4 | – | Pressure and power compensator main stage |
| 5 | – | Power compensator pilot stage |
| 6 | – | Power compensator pilot stage |

Control Options ST

General Description

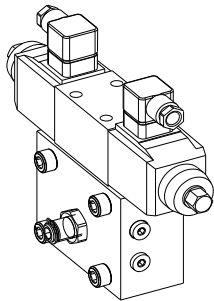
The energy-saving electrohydraulic displacement control type ST efficiently adjusts pump output by acting on the swashplate within electrically adjustable limits. The swashplate angle value is fed back to the controller unit via an electrical closed loop system. A proportional valve and servo piston use the controller output

signal to apply the required setting, resulting in a highly accurate dynamic control system.

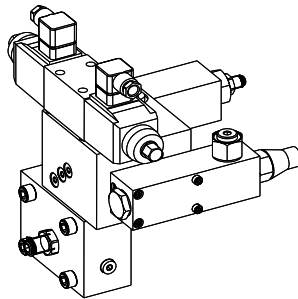
Hysteresis is approximately 1% of end value. The ST control can also be combined with hydromechanical relief valves for pressure and/or power control. Maximum pump flow can be limited mechanically to between 50% and 100% by a screw. As

an additional option, maximum (or minimum) flow can be set by a spacer inside the control cylinder (Model Code position **13**, options **4, 5 or 6**, in combination with customer adjustment specified in positions **40** to **43**). This solution is recommended for severe operating conditions and the need for high repeatability over a long period

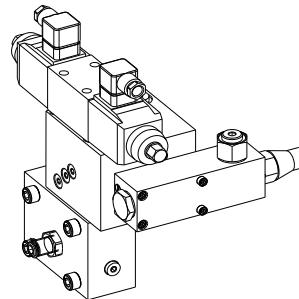
of time. The setting must be defined before ordering since it cannot be modified in operation. ST control will replace old SP control type for PVX pumps. ST-control requires a min. operation pressure of >25 bar for operation. Below this min. pressure value pump will automatically go on max. displacement.



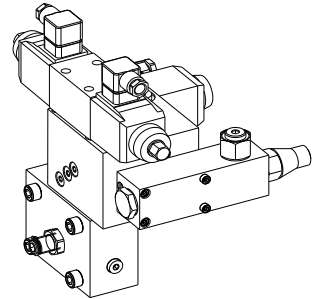
STC03A00



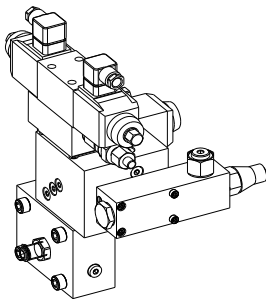
STC03A40



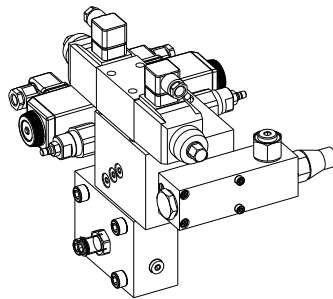
STC03A4F



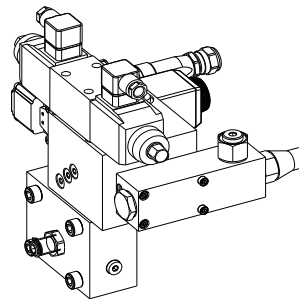
STC03A4K



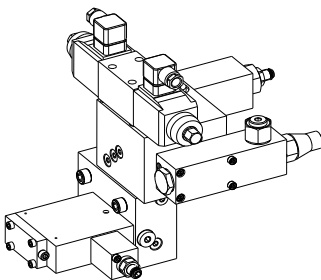
STC03A4K_C



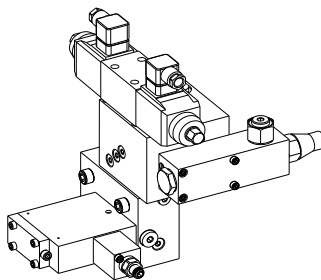
STC03A4B



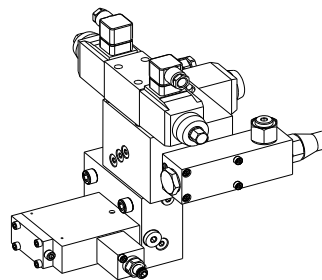
STC03A4L



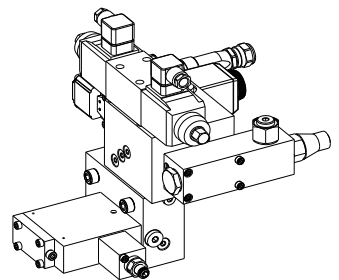
STC03A50



STC03A5F

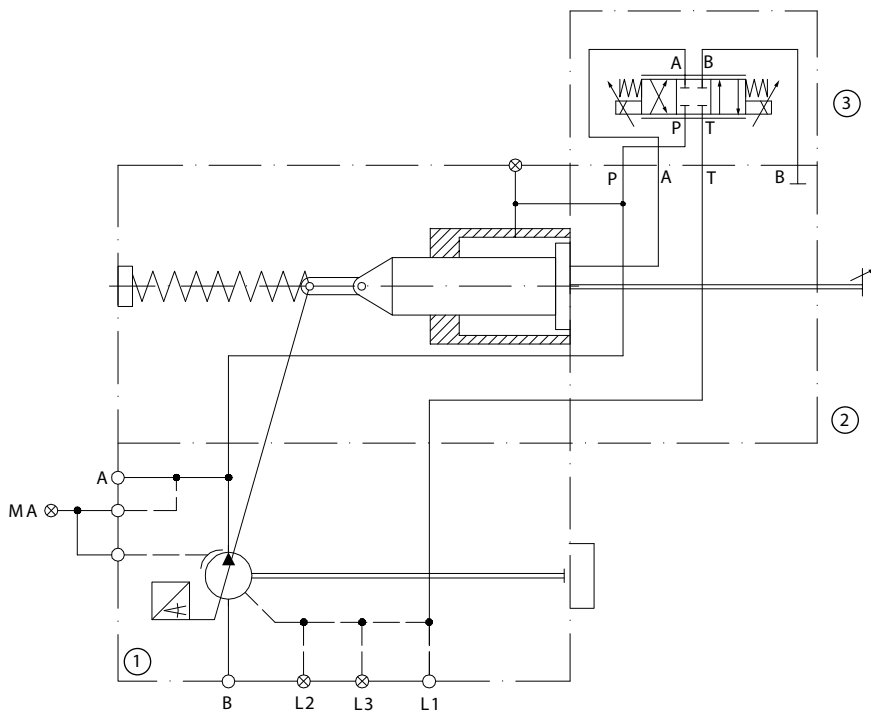
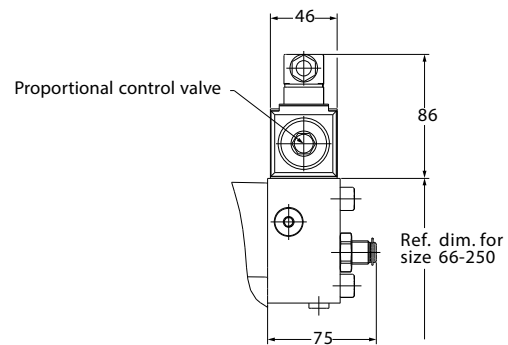
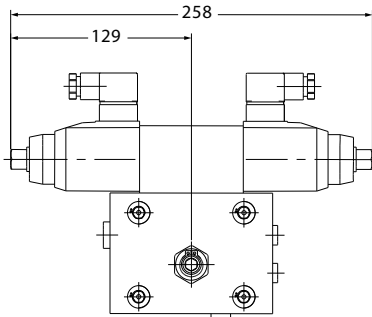
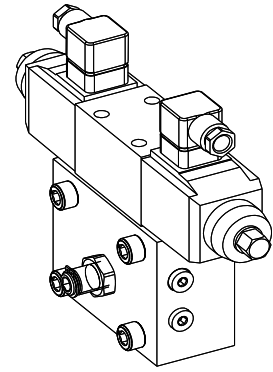


STC03A5K



STC03A5L

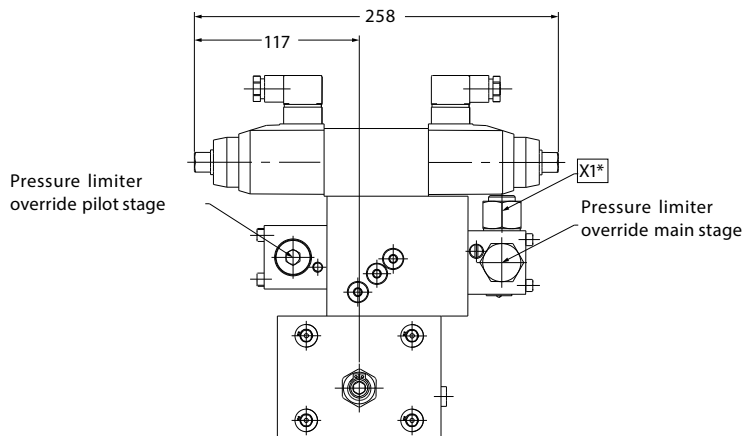
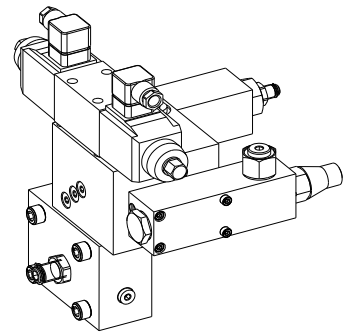
Control Options ST STC03A00



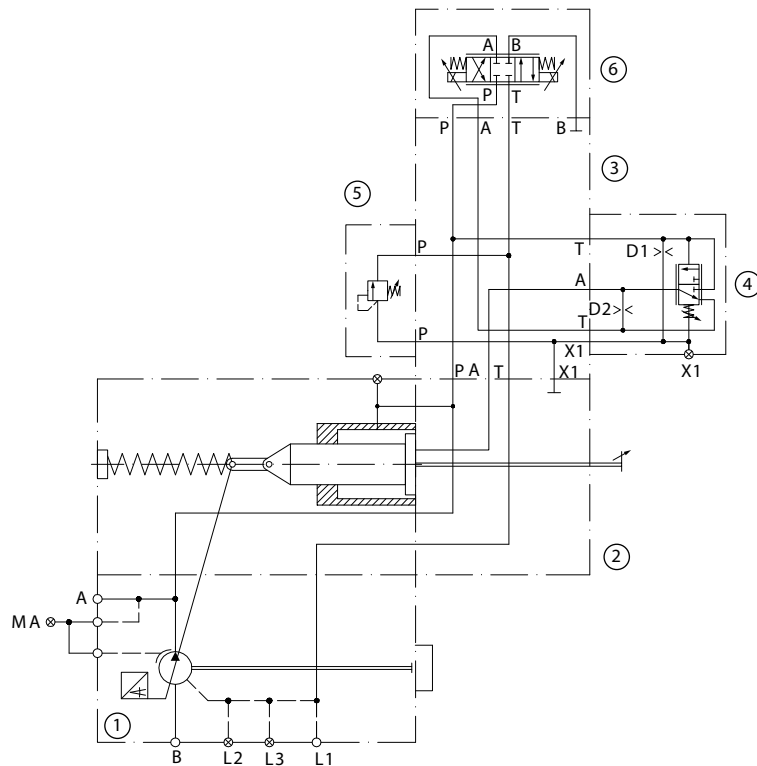
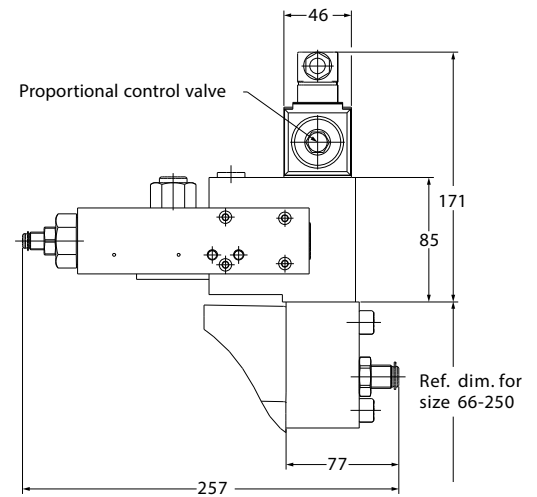
- A** – Systemport
- B** – Inlet port
- L1, L2** – Drain port
- L3** – Oil filling plug
- MA** – Gauge port-systempressure
- 1** – Basic pump
- 2** – Connection plate
- 3** – Proportional control valve

Control Options ST

STC03A40



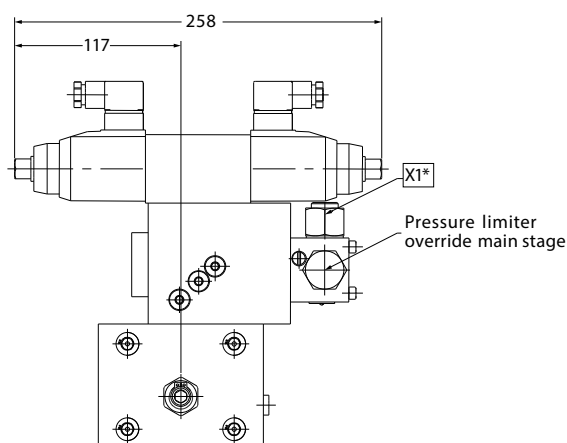
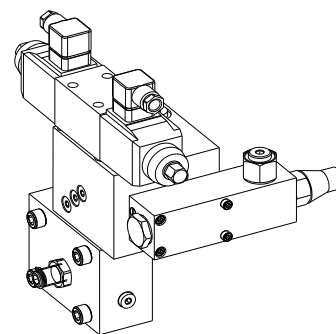
- X1 Remote port pressure limiter override. G 1/4"-12.5 DEEP
- ...* Connection with plug.



- | | |
|---------------|---|
| A | - Systemport |
| B | - Inlet port |
| L1, L2 | - Drain port |
| L3 | - Oil filling plug |
| MA | - Gauge port-system pressure |
| X1 | - Remote port pressure limiter override |
| 1 | - Basic pump |
| 2 | - Connection plate |
| 3 | - Connection plate for ST-control |
| 4 | - Pressure limiter override main stage |
| 5 | - Pressure limiter override pilot stage |
| 6 | - 4/3 Directional control valve |
| 7 | - Proportional control valve |

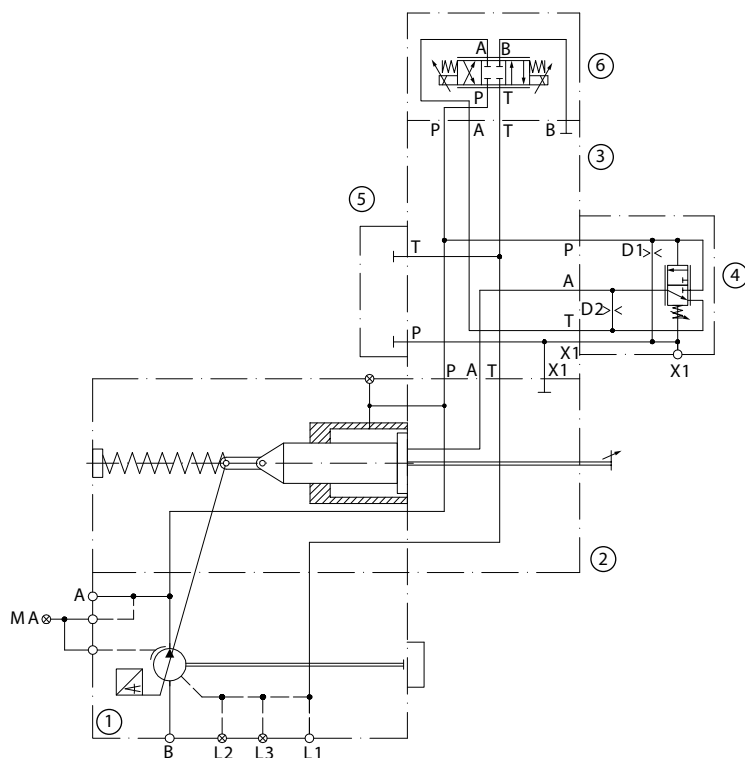
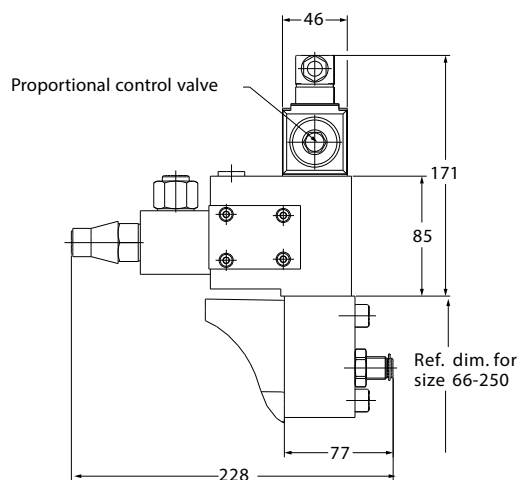
Control Options ST

STC03A4F



X1 Remote port pressure limiter override. G 1/4"-12.5 DEEP

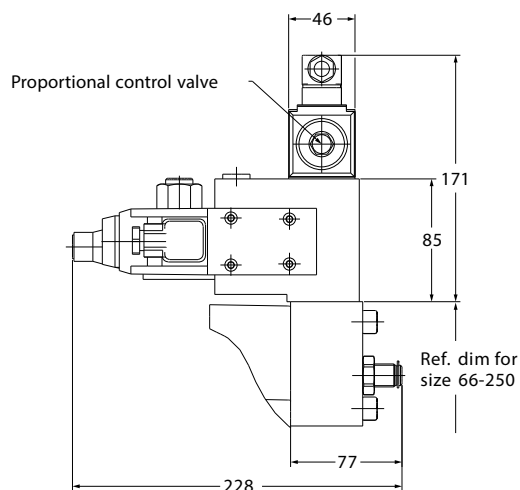
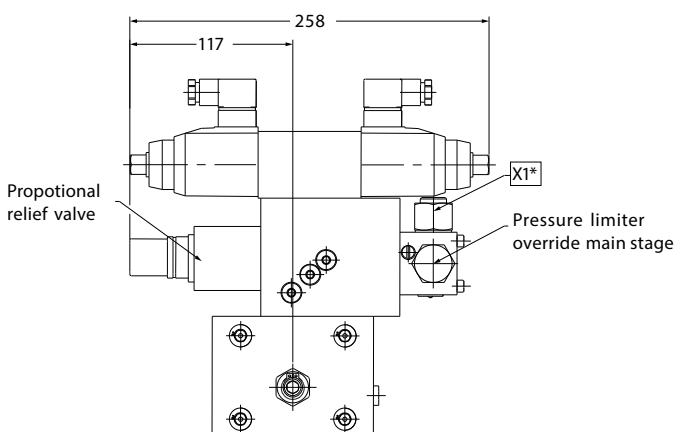
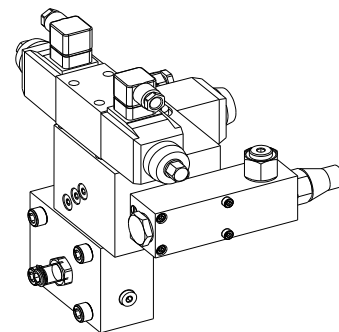
...* Connection with plug.



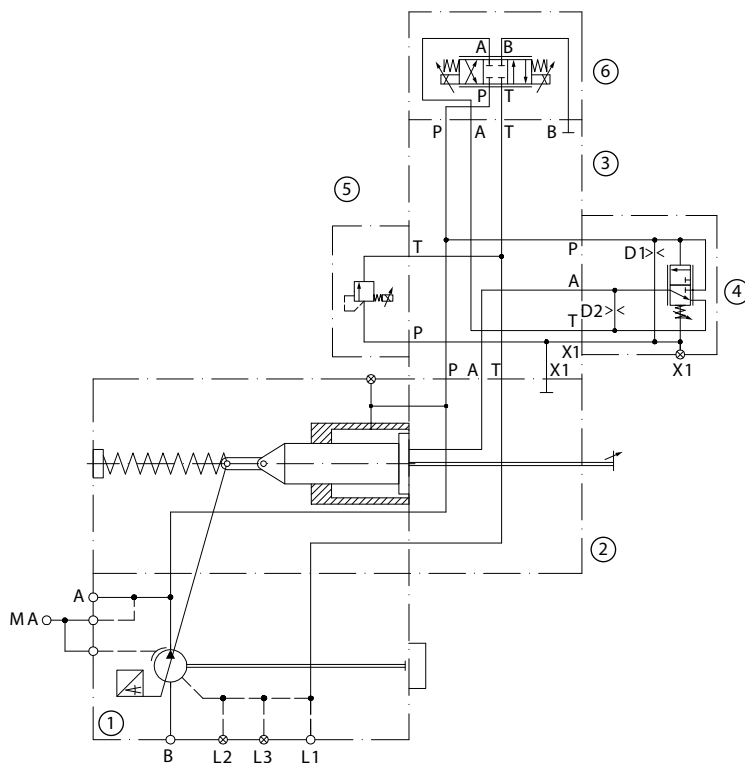
- A** - Systemport
- B** - Inlet port
- L1, L2** - Drain port
- L3** - Oil filling plug
- MA** - Gauge port-systempressure
- X1** - Remote port pressure limiter override
- 1** - Basic pump
- 2** - Connection plate
- 3** - Connectionplate for ST-control
- 4** - Pressure limiter override main stage
- 5** - Closing plate
- 6** - Proportional control valve

Control Options ST

STC03A4K



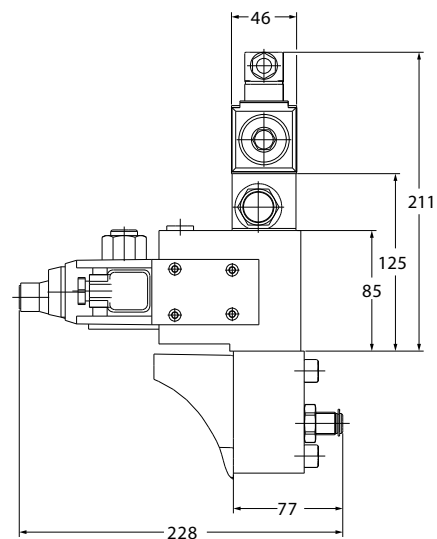
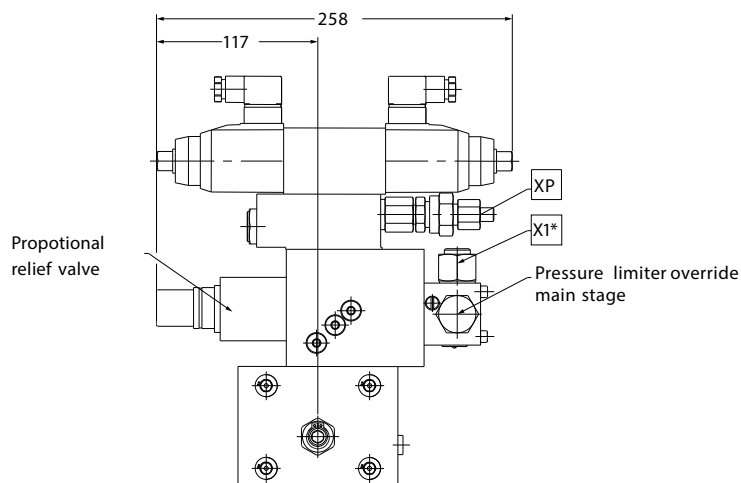
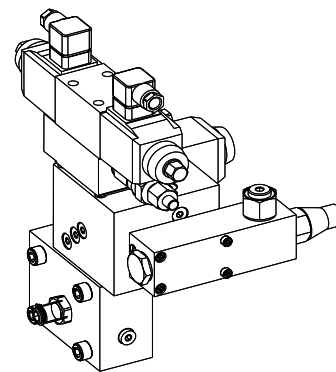
- X1 Remote port pressure limiter override. G 1/4"-12.5 DEEP
- ...* Connection with plug.



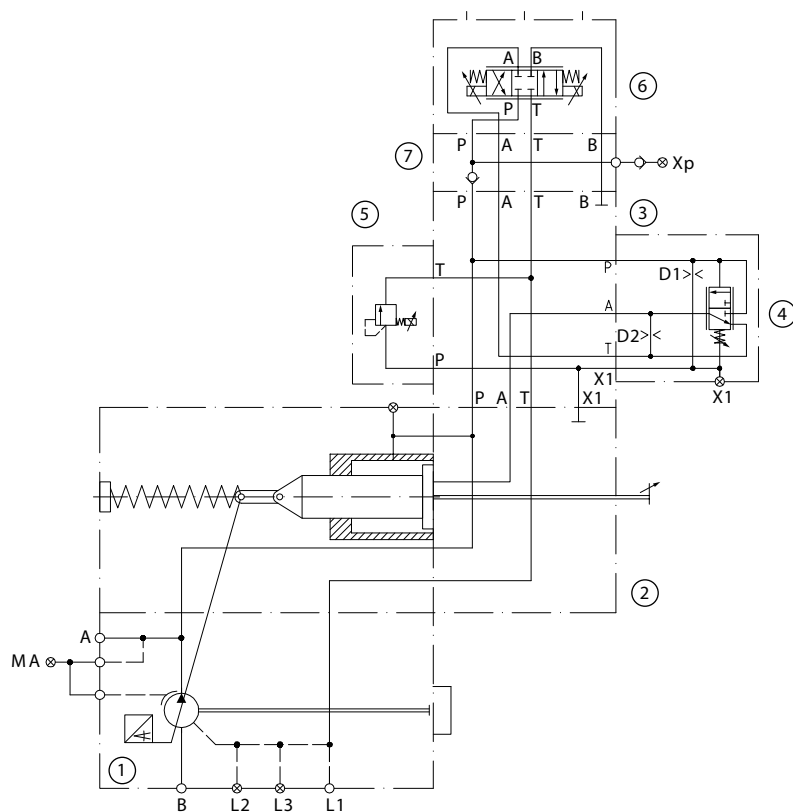
- A** - Systemport
- B** - Inlet port
- L1, L2** - Drain port
- L3** - Oil filling plug
- MA** - Gauge port-system pressure
- X1** - Remote port pressure limiter override
- 1** - Basic pump
- 2** - Connection plate
- 3** - Connection plate for ST-control
- 4** - Pressure limiter override main stage
- 5** - Proportional relief valve
- 6** - Proportional control valve

Control Options ST

STC03A4K____C

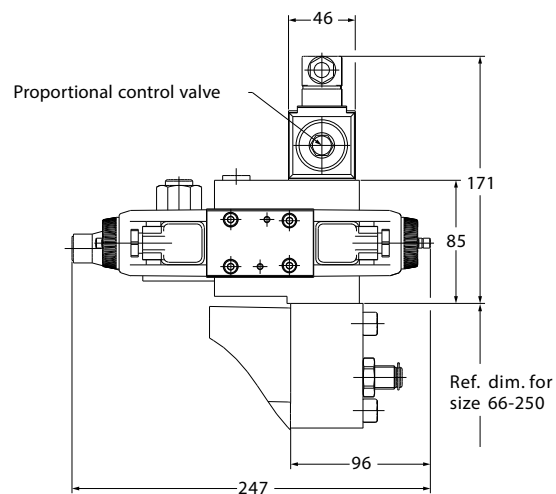


- XP** External pilot pressure (option VIA no return valve) 10L ACC. DIN EN ISO 8434-1
X1 Remote port pressure limiter override. G 1/4"-12.5 Deep
...* Connection with plug.



- | | |
|---------------|---|
| A | - System port |
| B | - Inlet port |
| L1, L2 | - Drain port |
| L3 | - Oil filling plug |
| MA | - Gauge port-system pressure |
| X1 | - Remote port pressure limiter override |
| XP | - External pilot pressure |
| 1 | - Basic pump |
| 2 | - Connection plate |
| 3 | - Connection plate for ST-control |
| 4 | - Pressure limiter override main stage |
| 5 | - Proportional relief valve |
| 6 | - Proportional control valve |
| 7 | - Adaptor block for pilot oil option |

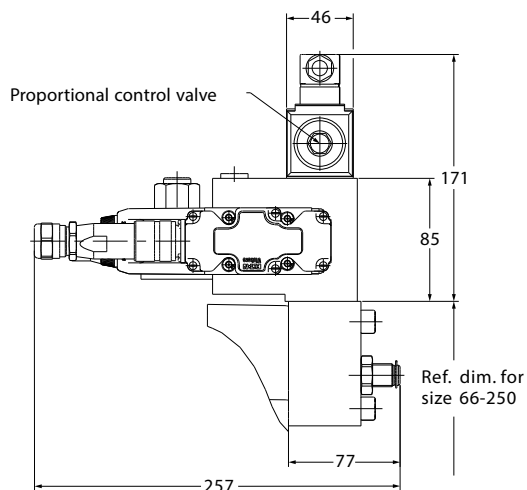
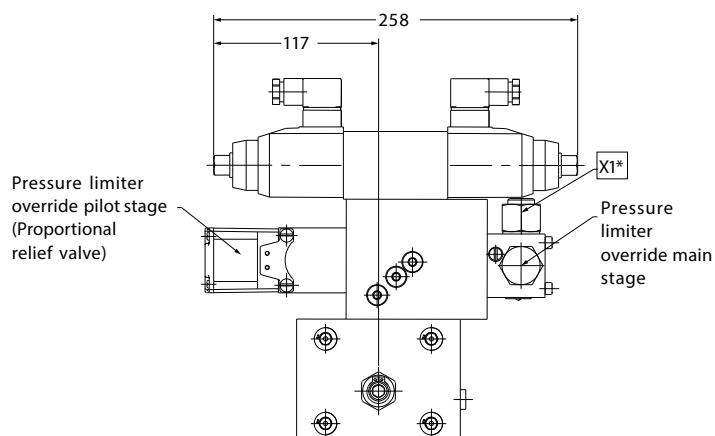
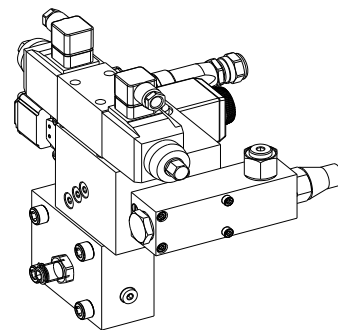
A detailed technical drawing of a 4/3-way directional control valve. The valve body is shown in an isometric view, featuring a solenoid actuator on top. The actuator is connected to a coil, which is labeled with 'N.C.' (Normally Closed) and 'N.O.' (Normally Open) terminals. The valve has four main ports: two on the left and two on the right. The left ports are labeled 'P' (Pressure) and 'T' (Tank/Return). The right ports are labeled 'A' and 'B'. The valve is shown in its center position, where both A and B ports are blocked. The drawing includes various mounting holes and a central port for a pilot line.



- [illegible]

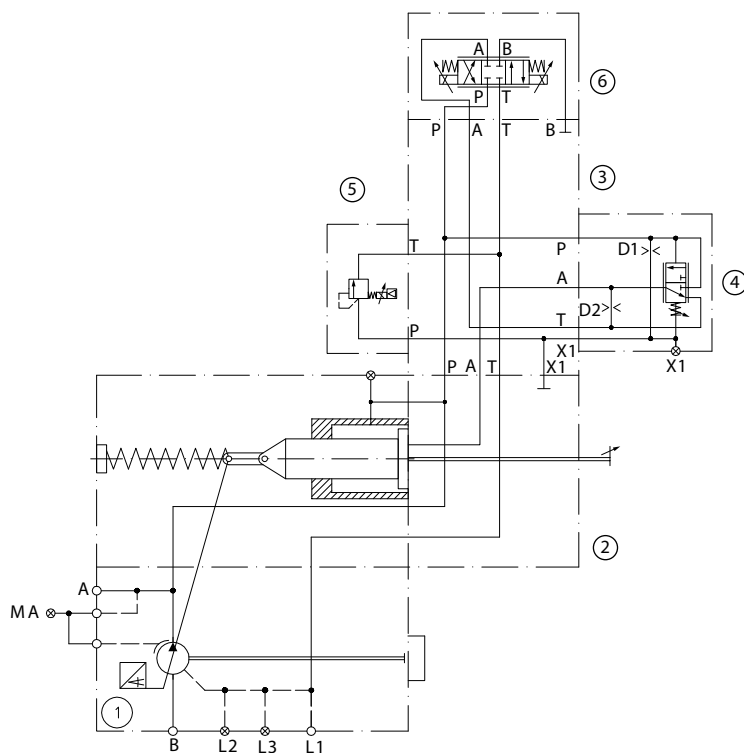
- 53

Control Options ST STC03A4L



X1 Remote port pressure limiter override. G 1/4"-12.5 DEEP

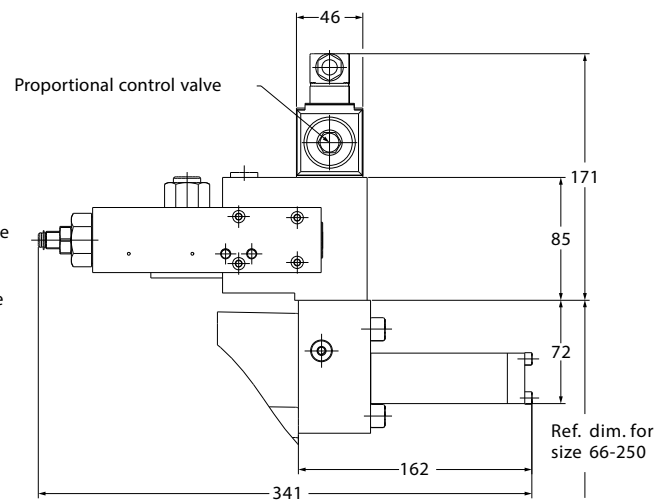
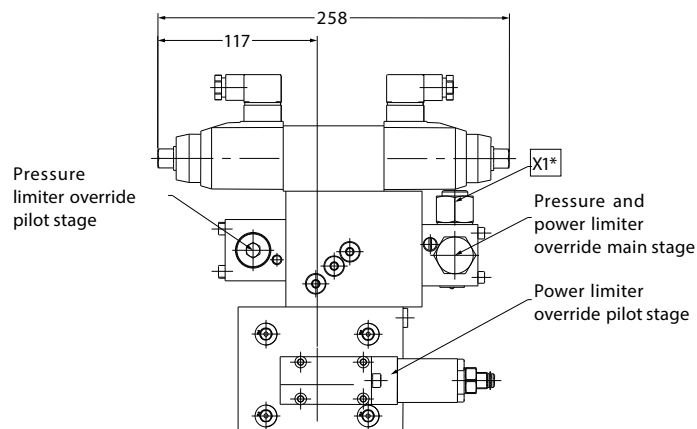
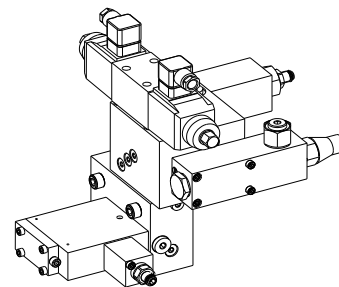
...* Connection with plug.



- | | |
|---------------|---|
| A | - System port |
| B | - Inlet port |
| L1, L2 | - Drain port |
| L3 | - Oil filling plug |
| MA | - Gauge port-system pressure |
| X1 | - Remote port pressure limiter override |
| 1 | - Basic pump |
| 2 | - Connection plate |
| 3 | - Connection plate for ST-control |
| 4 | - Pressure limiter override main stage |
| 5 | - Pressure limiter override pilot stage (Proportional relief valve + OBE) |
| 6 | - Proportional control valve |

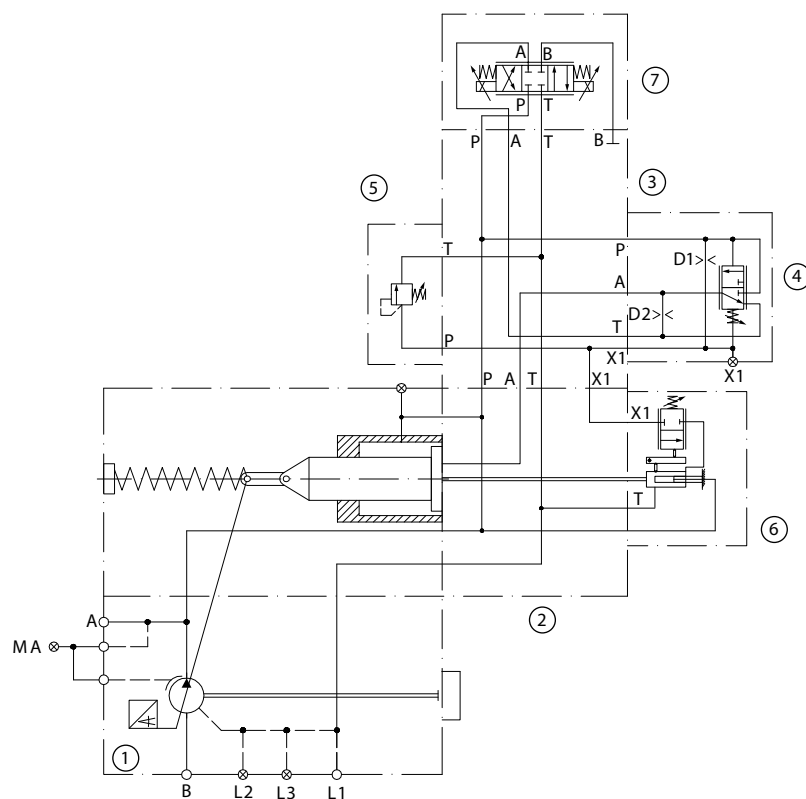
Control Options ST

STC03A50



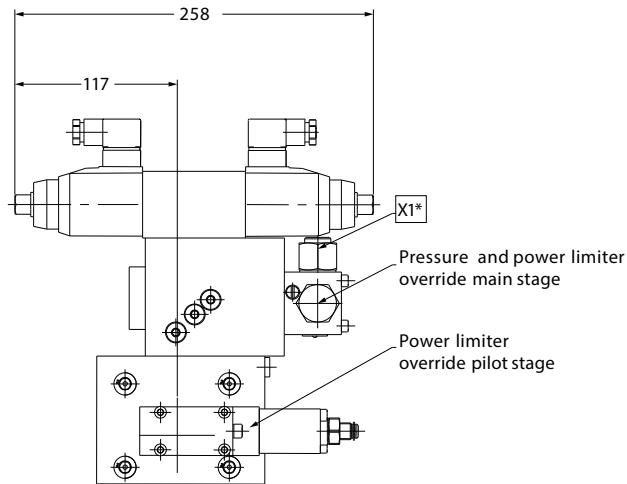
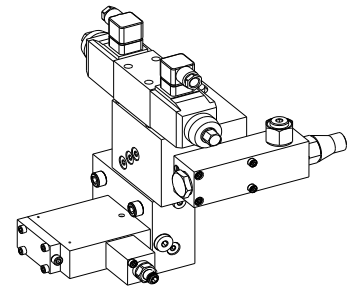
X1 Remote port pressure limiter override. G 1/4"-12.5 DEEP

...* Connection with plug.

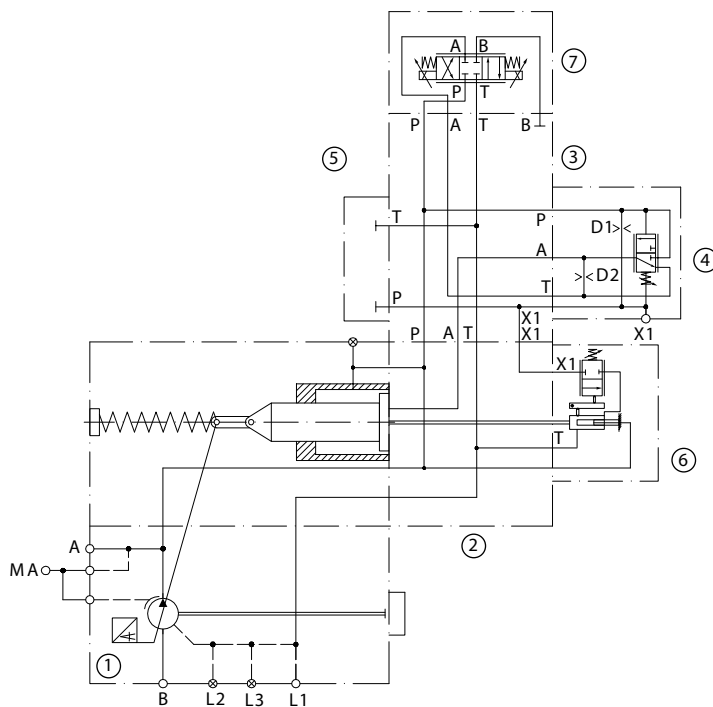
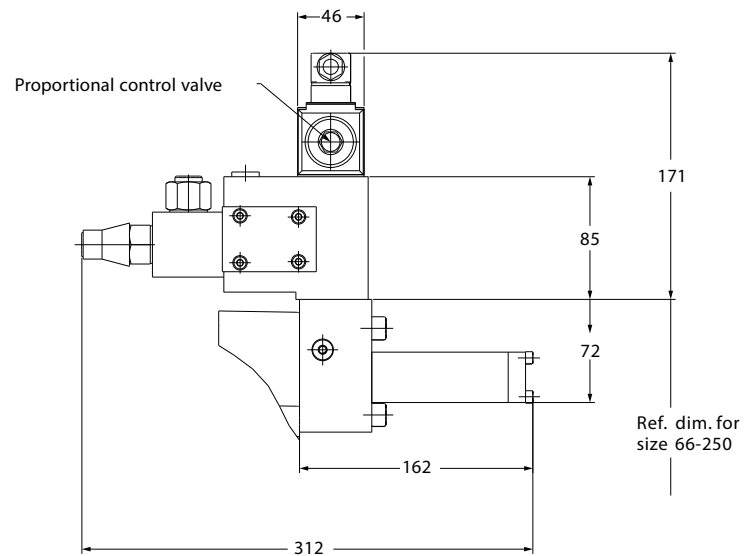


- | | |
|---------------|--|
| A | - Systemport |
| B | - Inlet port |
| L1, L2 | - Drain port |
| L3 | - Oil filling plug |
| MA | - Gauge port-system pressure |
| X1 | - Remote port pressure limiter override |
| 1 | - Basic pump |
| 2 | - Connection plate |
| 3 | - Connection plate for ST-control |
| 4 | - Pressure and power limiter override main stage |
| 5 | - Pressure limiter override pilot stage |
| 6 | - Power limiter override pilot stage |
| 7 | - Proportional control valve |

Control Options ST STC03A5F



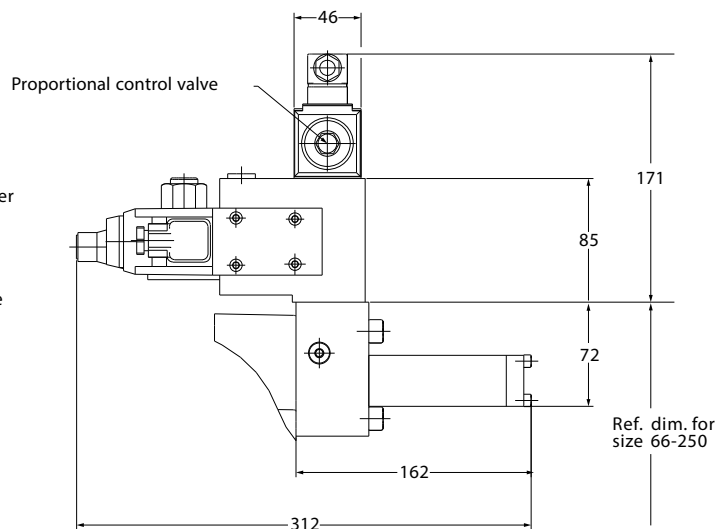
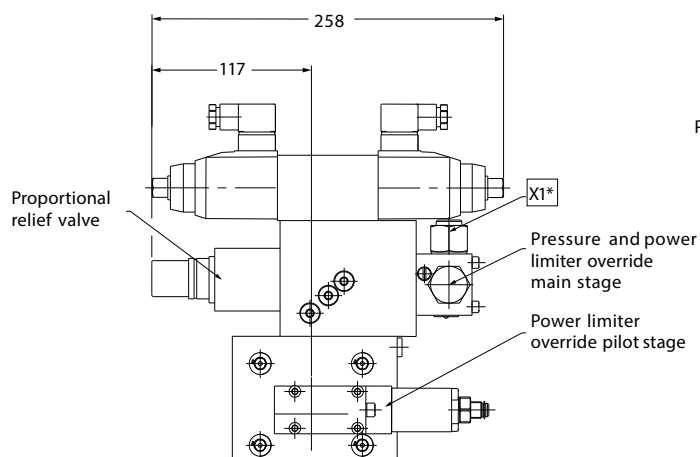
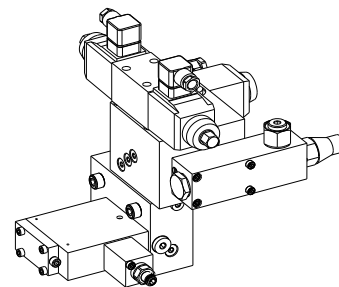
- X1 Remote port pressure limiter override. G 1/4"-12.5 DEEP
- ...* Connection with plug.



- A** - Systemport
- B** - Inlet port
- L1, L2** - Drain port
- L3** - Oil filling plug
- MA** - Gauge port-system pressure
- X1** - Remote port pressure limiter override
- 1** - Basic pump
- 2** - Connection plate
- 3** - Connection plate for ST-control
- 4** - Pressure and power limiter override main stage
- 5** - Closing plate
- 6** - Power limiter override pilot stage
- 7** - Proportional control valve

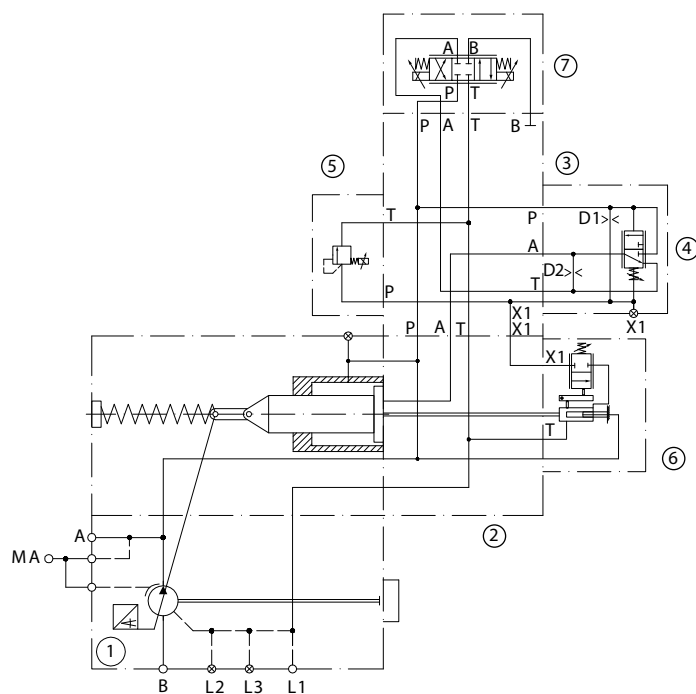
Control Options ST

STC03A5K



X1 Remote port pressure limiter override. G 1/4"-12.5 DEEP

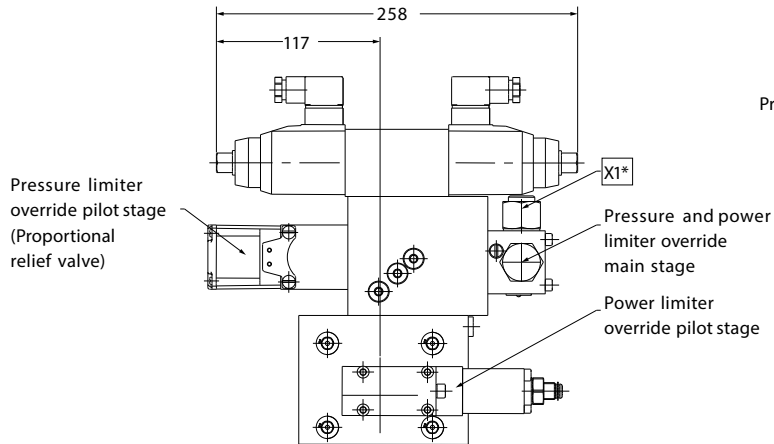
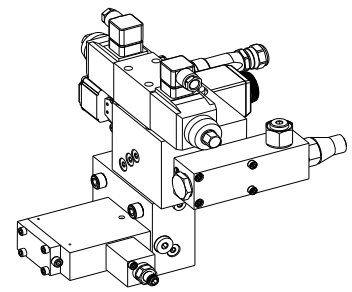
...* Connection with plug.



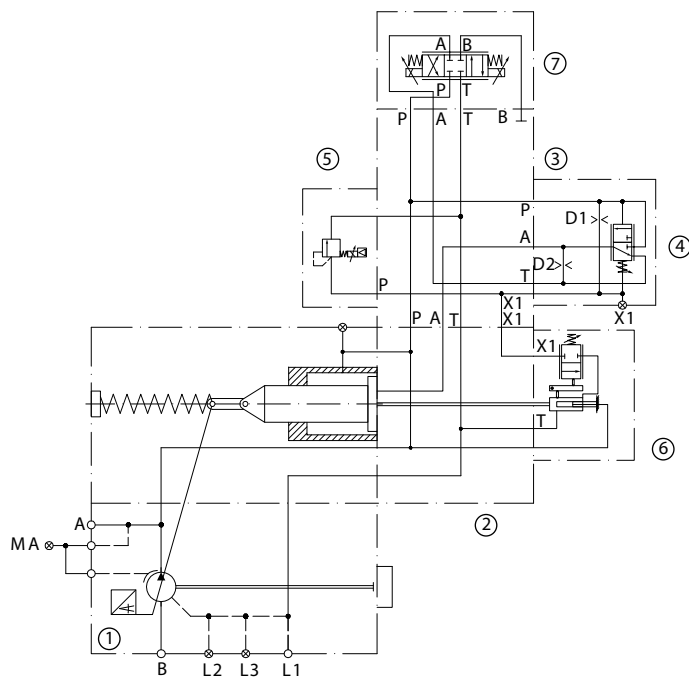
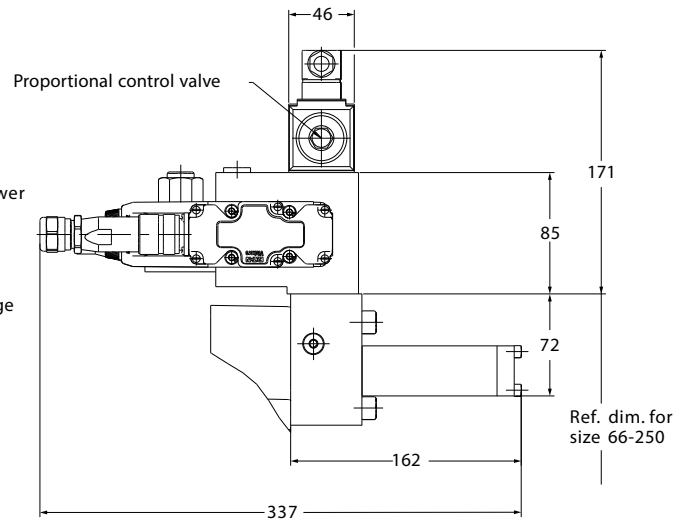
- | | |
|---------------|--|
| A | - System port |
| B | - Inlet port |
| L1, L2 | - Drain port |
| L3 | - Oil filling plug |
| MA | - Gauge port-system pressure |
| X1 | - Remote port pressure limiter override |
| 1 | - Basic pump |
| 2 | - Connection plate |
| 3 | - Connection plate for ST-control |
| 4 | - Pressure and power limiter override main stage |
| 5 | - Proportional relief valve |
| 6 | - Power limiter override pilot stage |
| 7 | - Proportional control valve |

Control Options ST

STC03A5L



- X1 Remote port pressure limiter override. G 1/4"-12.5 DEEP
- ...* Connection with plug.



- | | |
|---------------|---|
| A | – Systemport |
| B | – Inlet port |
| L1, L2 | – Drain port |
| L3 | – Oil filling plug |
| MA | – Gauge port-systempressure |
| X1 | – Remote port pressure limiter override |
| 1 | – Basic pump |
| 2 | – Connection plate |
| 3 | – Connectionplate for ST-control |
| 4 | – Pressure and powerlimiter override main stage |
| 5 | – Pressure limiter override pilot stage (Proportional relief valve + OBE) |
| 6 | – Power limiter override pilot stage |
| 7 | – Proportional control valve |

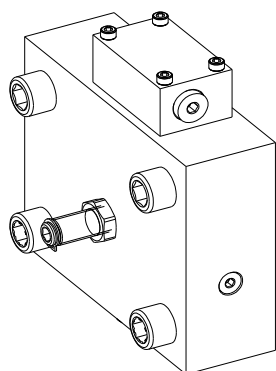
Control Options FM

General Description

FM The FM - control is a displacement control where the pump flow can be manually adjusted by a screw. The maximum (and/or minimum) flow can be limited by a spacer inside the control cylinder

(position number **13** in model coding, options **4, 5** or **6** in combination with customer adjustment specifications position **40-43** for the set values). The setting must be defined before ordering and cannot be modified during

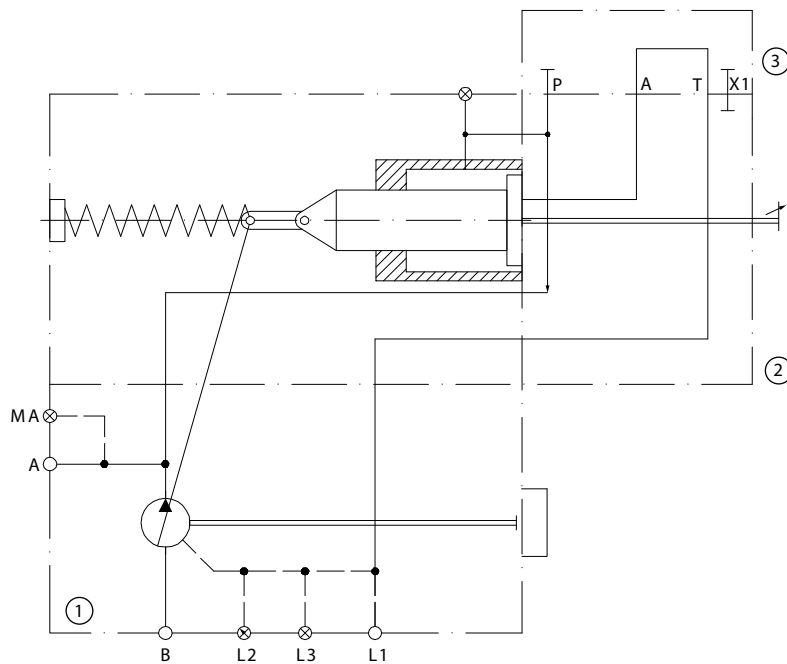
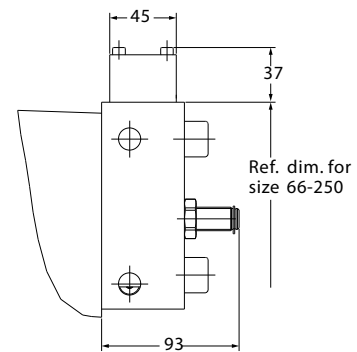
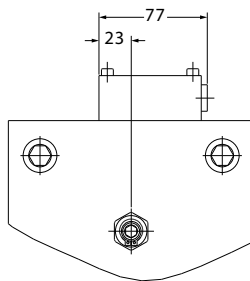
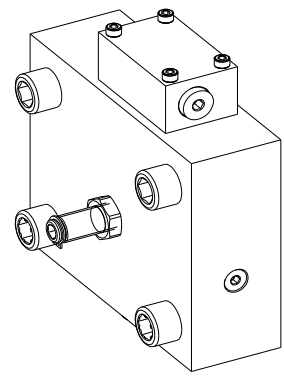
operation. FM-control is replacing old-style FE and HG control. Please be aware that adjustment of screw is only possible with load pressure below ca. 30 bar.



FM000A0

Control Options FM

FM000A0



- A** – Systemport
- B** – Inlet port
- L1, L2** – Drain port
- L3** – Oil filling plug
- MA** – Gauge port-systempressure
- 1** – Basic pump
- 2** – Connectionplate for FM-control
- 3** – Adaptor plate

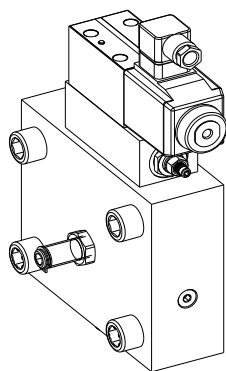
Control Options ZP

General Description

ZP The ZP-control is a dual-displacement control where the pump flow can be adjusted to two different positions by a solenoid valve. The maximum (and/or minimum) flow can be limited by a spacer inside the control cylinder (position number

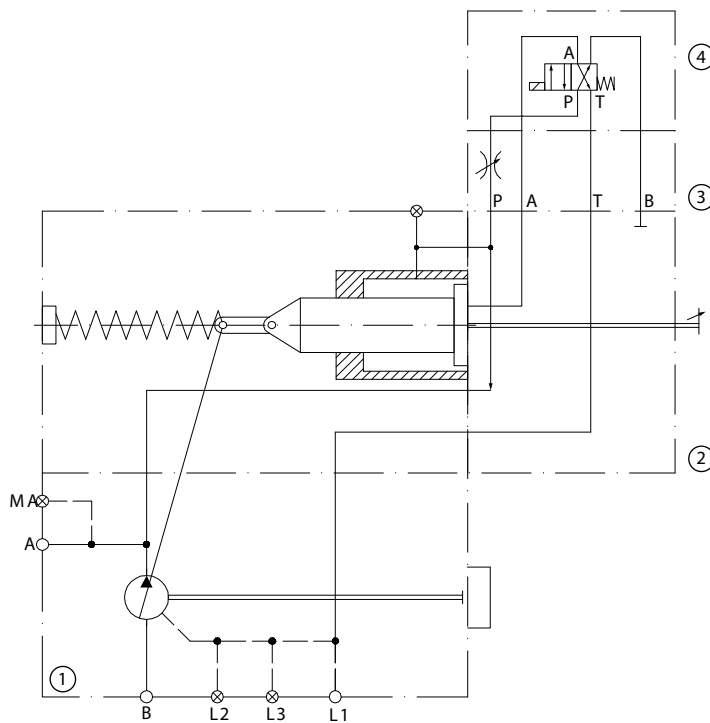
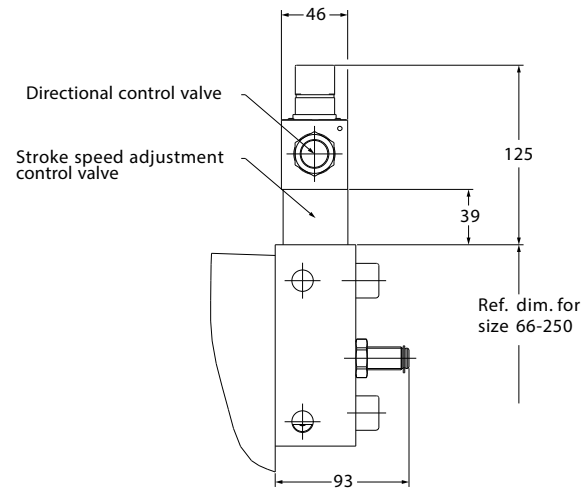
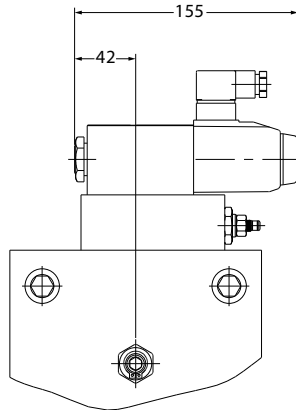
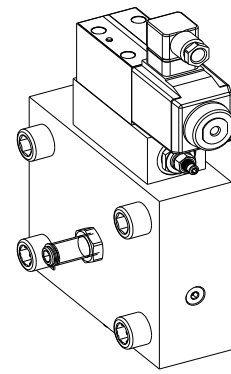
13 in model coding, options **4, 5** or **6** in combination with customer adjustment specifications position **40-43** for the set values). The setting must be defined before ordering and cannot be modified during operation. Standard setting will be max. displacement

(with solenoid de-energized), and 50% of displacement with solenoid activated. Other adjustments need to be defined by customer adjustment specification code.



ZP100A0

Control Options ZP ZP100A0



- | | |
|---------------|---|
| A | - System port |
| B | - Inlet port |
| L1, L2 | - Drain port |
| L3 | - Oil filling plug |
| MA | - Gauge port-system pressure |
| 1 | - Basic pump |
| 2 | - Connection plate for ZP-control |
| 3 | - Stroke speed adjustment control valve |
| 4 | - Directional control valve |

Control Options SP

General Description

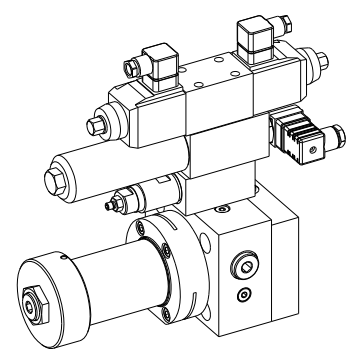
The energy-saving electrohydraulic displacement control type **SP** efficiently adjusts pump output by acting on the swashplate within electrically adjustable limits. The swashplate angle value is fed back to the controller unit via an electrical closed loop system.

A proportional valve and servo piston use the controller output signal to apply the required setting, resulting in a highly accurate dynamic control system.

Hysteresis is approximately 1% of end value. The SP control can also be combined with hydromechanical relief valves for pressure control.

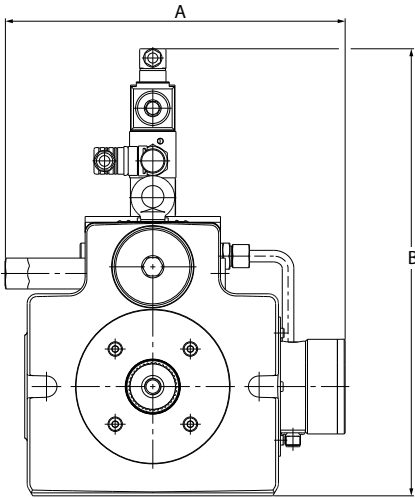
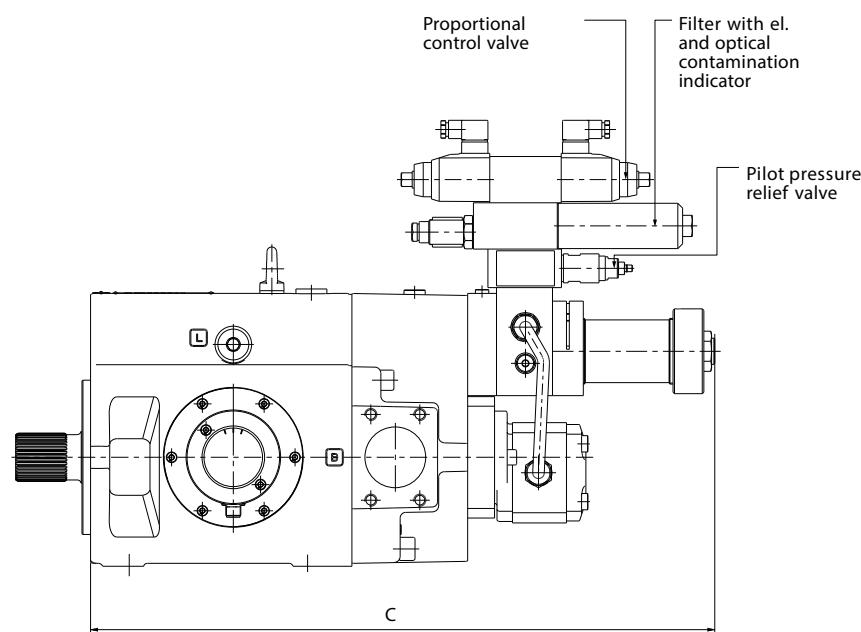
As an additional option, maximum (or minimum) flow can be set by a spacer inside the control cylinder (Model Code position **13**, options **4, 5** or **6**, in combination with customer adjustment specified in positions **40** to **43**).

This solution is recommended for severe operating conditions and the need for high repeatability over a long period of time. The setting must be defined before ordering since it cannot be modified in operation..



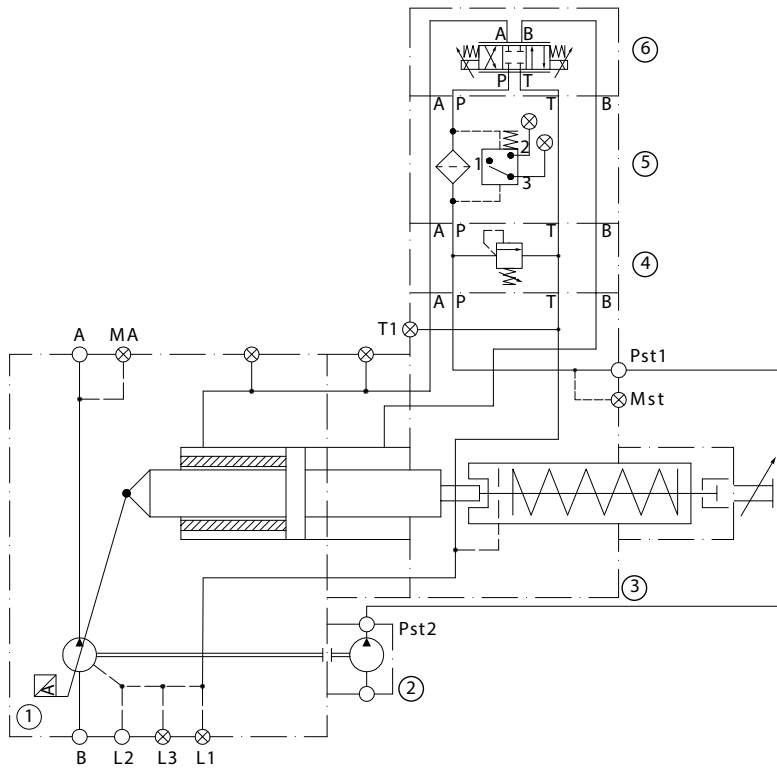
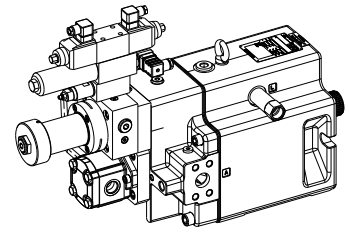
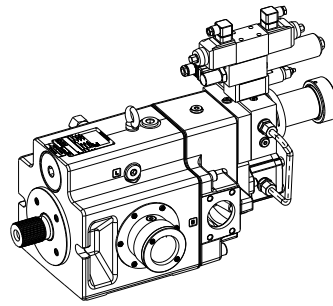
SPC03A

	A	B	C
066	291	407	501
090	291	407	501
130	352	463	647
180	352	463	647
250	217	534	813



Control Options SP

SPC03A



- A** – Systemport
- B** – Inlet port
- L1, L2** – Drain port
- L3** – Oil filling plug
- MA** – Gauge port-systempressure
- Pst1** – Ports for pilot pump
- Pst2** – Pilot pumpoutlet port
- Mst** – Gauge port-pilot pressure
- T1** – Return line of control circuit (optional)
- 5** – Inlet of pilot pump
- 1** – Basic pump
- 2** – Pilot pump
- 3** – Connectionplate for SP-control
- 4** – Pilot pressure relief valve
- 5** – Pilot oil filter
- 6** – Proportional control valve

Control Options ES

Available to special order only.

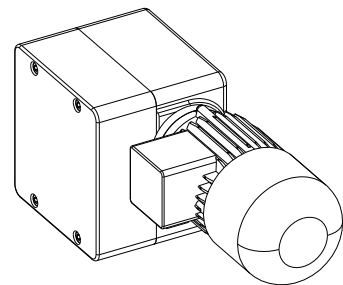
General Description

This unit is used for flow adjustment. It has a 3-phase electric servo-motor, worm-gear and a switchbox with 4 or (optional) 8 limit switches for different positions.

A potentiometer for stepless adjustment and/or position monitoring is also available. Response times from zero to maximum depend on the ratio selected and on the (fixed) speed of the servo-motor,

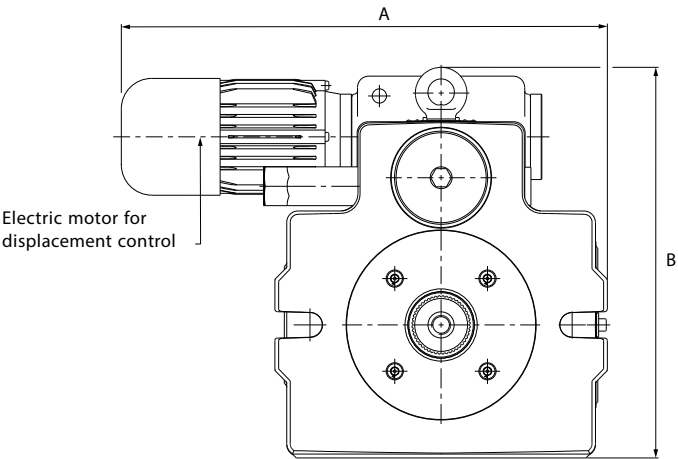
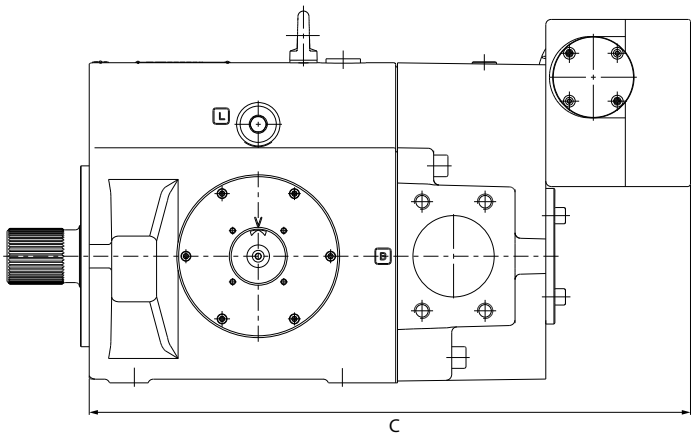
with the result that once the control is specified and built, response time are not variable in operation. Explosion Protection versions are also available.

No Pressure/Power Limiter possible!



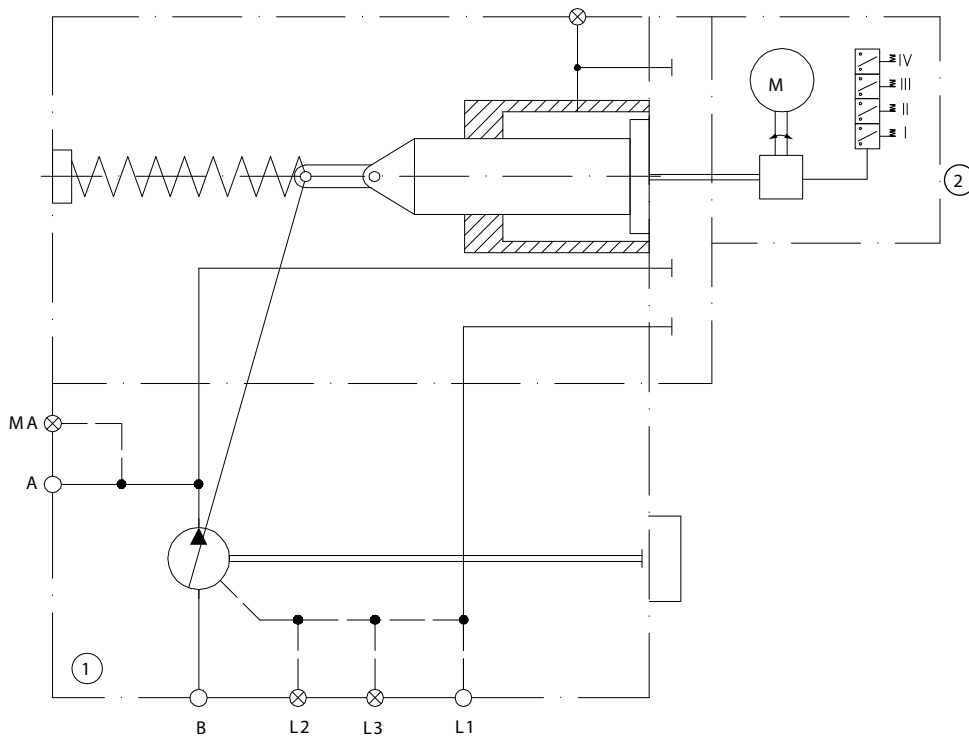
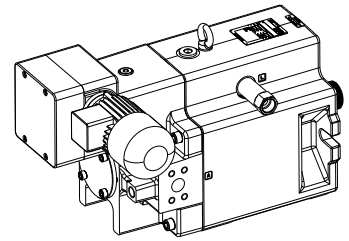
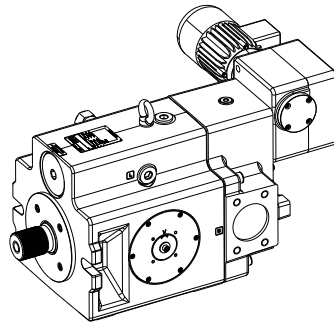
ESN00A00

	A	B	C
066	291	407	501
090	291	407	501
130	352	463	647
180	352	463	647
250	217	534	813



Control Options ES

ESN00A00



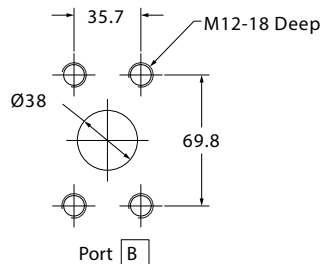
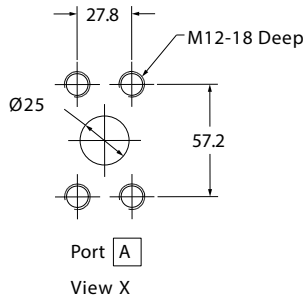
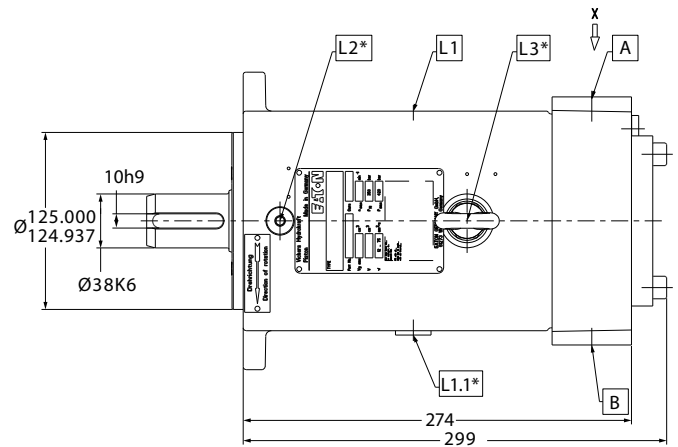
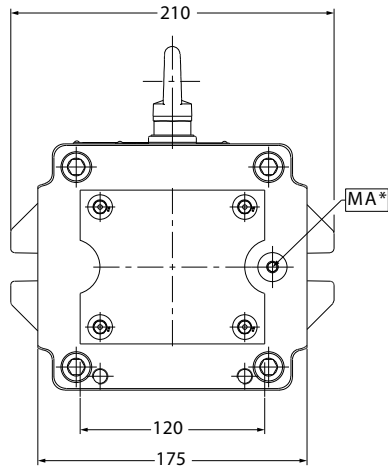
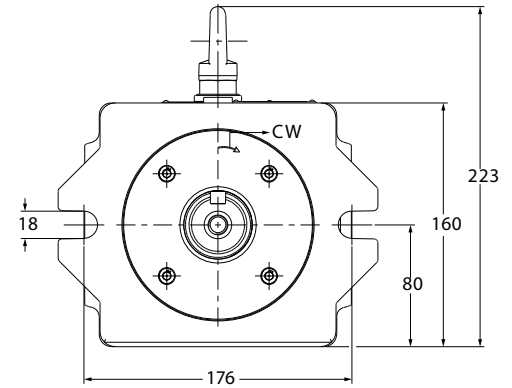
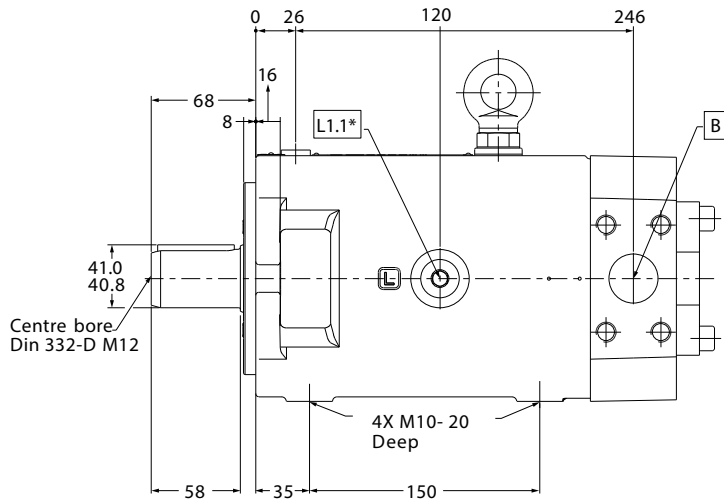
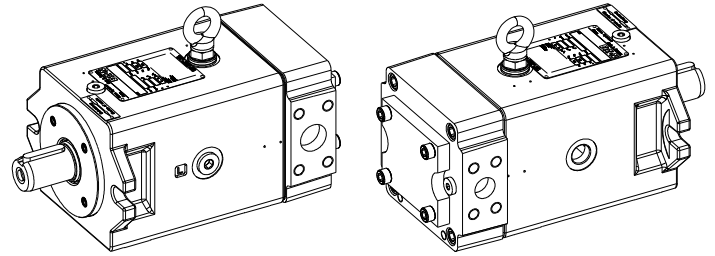
- A** – Systemport
- B** – Inlet port
- L1, L2** – Drain port
- L3** – Oil filling plug
- MA** – Gauge port-system pressure
- 1** – Basic pump
- 2** – Electric motor and limit switch for ES-control

General Dimensions

PFXS-066

Options illustrated:

- 12 = **R** (Clockwise rotation)
- 14 15 = **00** (No thru drive)
- 18 19 = **01** (ISO keyed shaft)
- 22 = **0** (No yoke position indicator)
- 24 25 = **00** (Without control)



- A** - System pressure port ISO 6162-2 P25M (SAE J518 CODE 62-1" - 6000 PSI)
- B** - Inlet port ISO 6162-1 P38M (SAE J518 CODE 61 - 1 1/2" 500 PSI)
- L1** - Drain port M26 x 1.5 (According to mounting position use upper port)
- L1.1** - Drain port 7/8"-14 UNF (According to mounting position use upper port)

- L2** - Ventilation port for vertical mounting G 1/4" (Shaft upward)
- L3** - Oil filling plug M26 x 1.5
- MA** - Gauge port system pressure G 1/4"
- ...* - Connection with plug

General Dimensions

PFXS-090

Options illustrated:

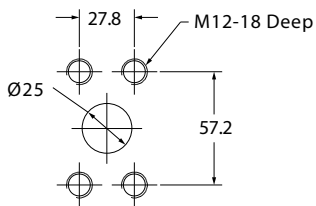
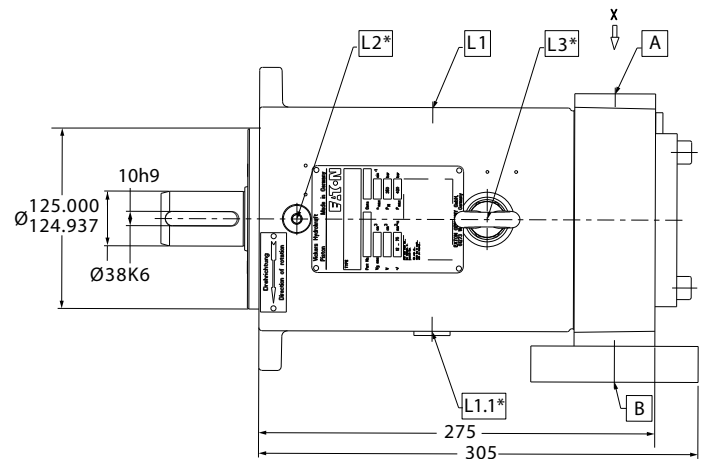
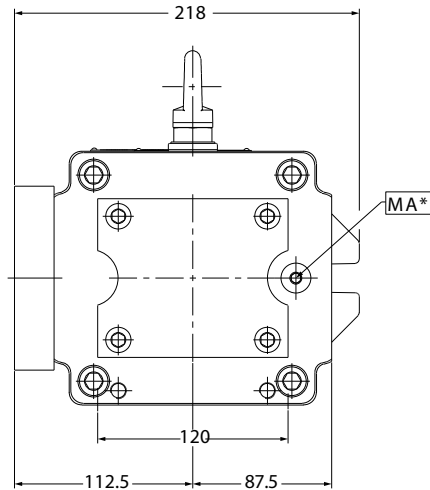
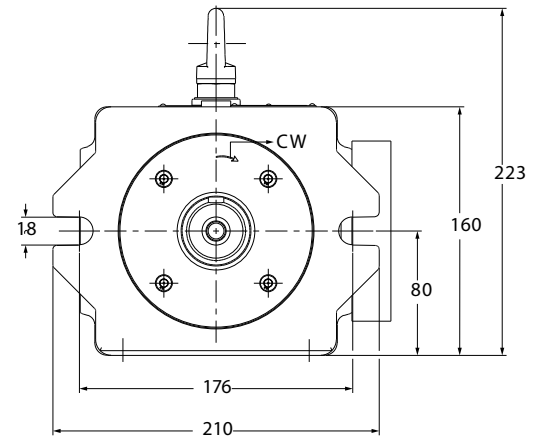
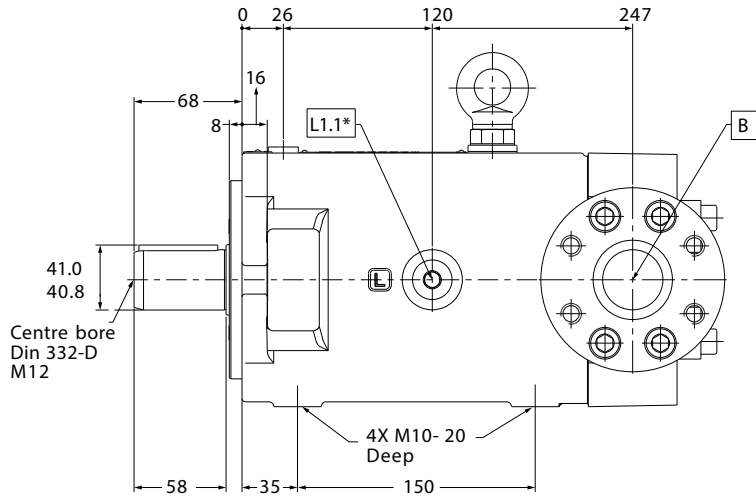
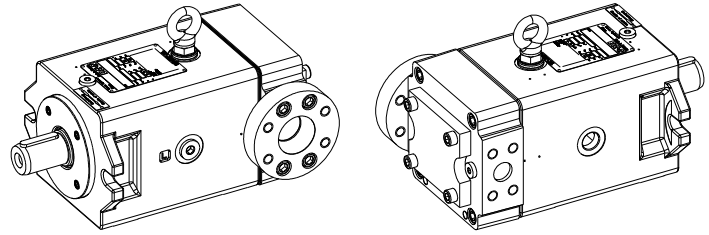
12 = **R** (Clockwise rotation)

14 15 = **00** (No thru drive)

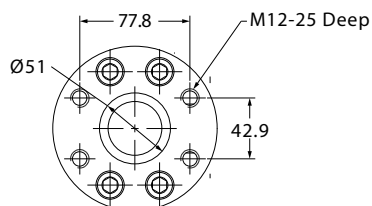
18 = **01** (ISO keyed shaft)

22 = **0** (No yoke position indicator)

24 25 = **00** (W ithout control)



Port **A**
View X



Port **B**

A - System pressure port ISO 6162-2 P25M (SAE J518 CODE 62 - 1" - 6000 PSI)

B - Inlet port ISO 6162-1 P51M (SAE J518 CODE 61 - 2 - 500 PSI)

L1 - Drain port M26x1.5 (According to mounting position use upper port)

L1.1 - Drain port 7/8"-14 UNF (According to mounting position use upper port)

L2 - Ventilation port for vertical mounting G 1/4" (Shaft upward)

L3 - Oil filling plug M26 x 1.5

MA - Gauge port system pressure G 1/4"

...* - Connection with plug

General Dimensions

PFXS-130

Options illustrated:

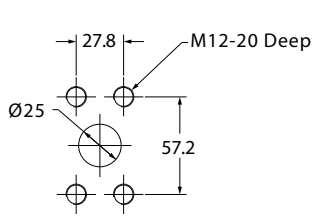
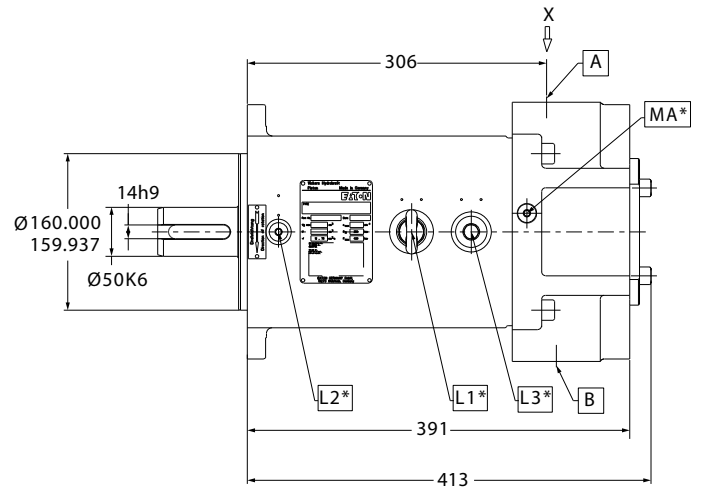
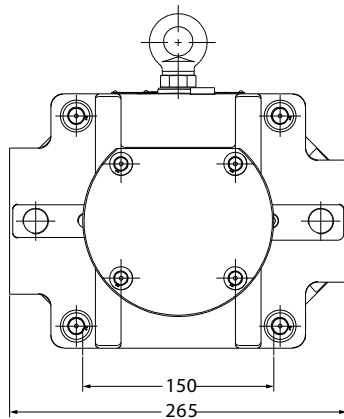
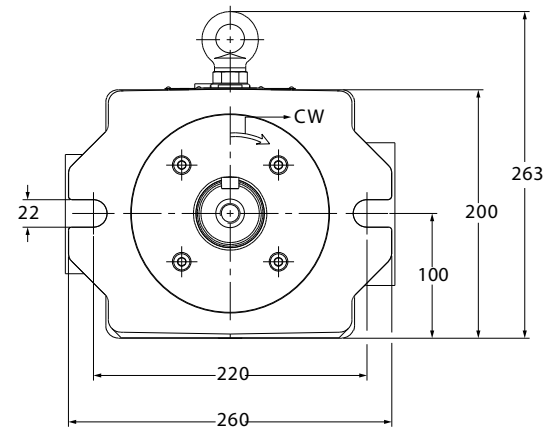
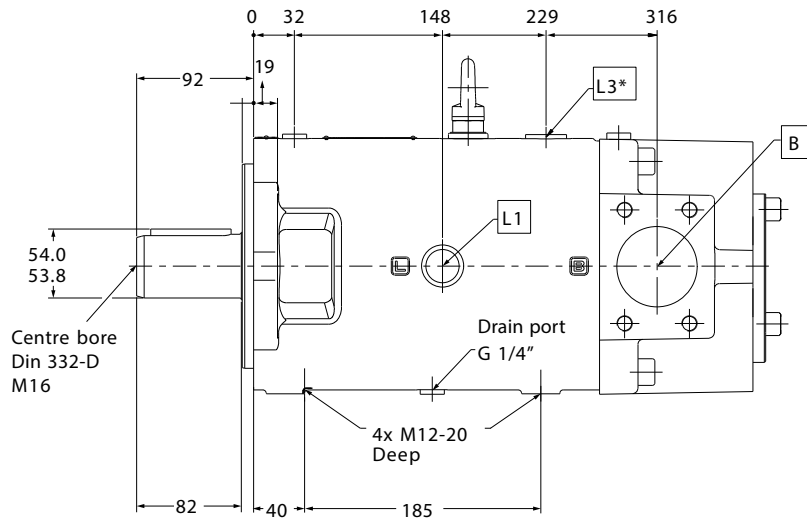
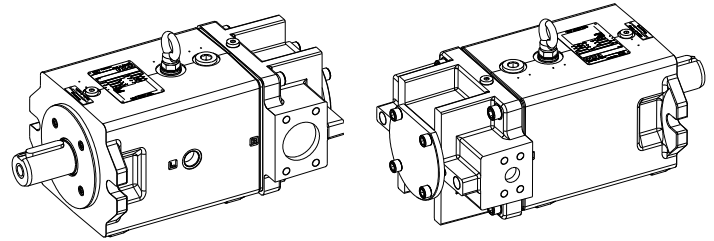
12 = **R** (Clockwise rotation)

14|15 = **00** (No thru drive)

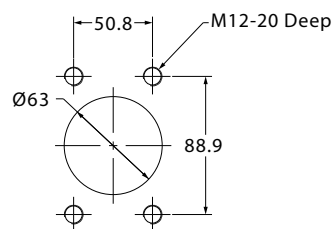
18 = **01** (ISO keyed shaft)

22 = **0** (No yoke position indicator)

24|25 = **00** (W ithout control)



Port **A**
View X



Port **B**

- A** - System pressure port ISO 6162-2 P25M (SAE J518 CODE 62-1" - 6000 PSI)
- B** - Inlet port ISO 6162-1 P64M (SAE J518 CODE 61 - 2 1/2" 500 PSI)
- L1** - Drain port M26 x 1.5 (According to mounting position use upper port)

- L2** - Ventilation port for vertical mounting G 1/4" (Shaft upward)
- L3** - Oil filling plug 1 1/6"-12UNF
- MA** - Gauge port system pressure G 1/4"
- ...* - Connection with plug

General Dimensions

PFXS-180

Options illustrated:

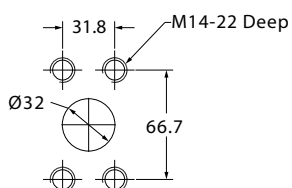
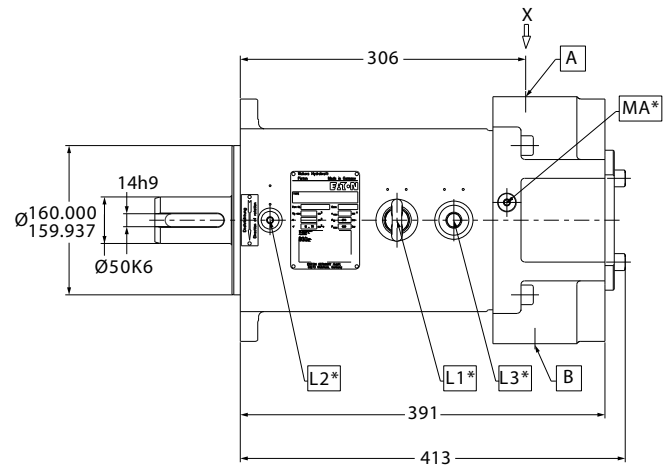
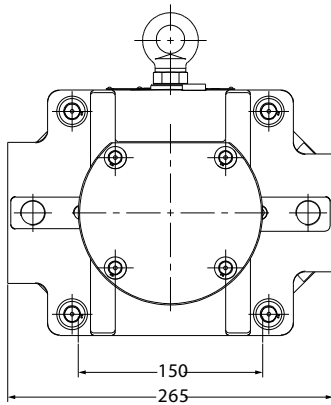
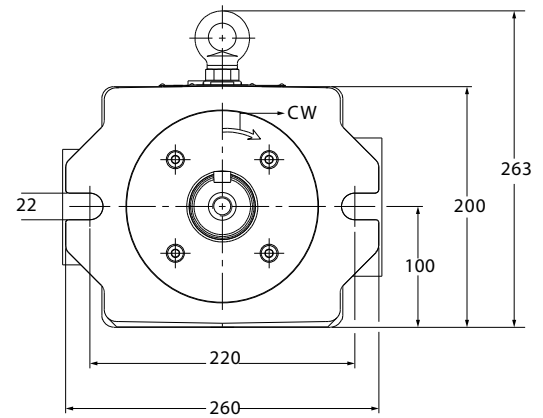
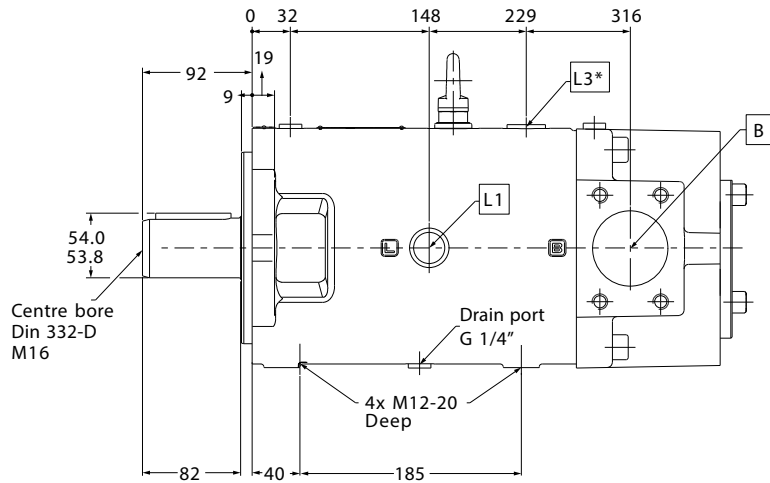
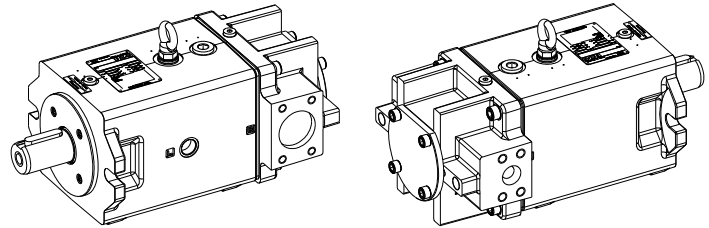
12 = **R** (Clockwise rotation)

14 15 = **00** (No thru drive)

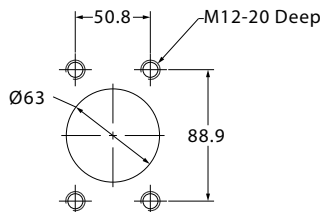
18 = **01** (ISO keyed shaft)

22 = **0** (No yoke position indicator)

24 25 = **00** (W ithout control)



Port **A**
View X



Port **B**

- A** - System pressure port ISO 6162-2 P32M (SAE J518 CODE 62 - 1 1/4" - 6000 PSI)
- B** - Inlet port ISO 6162-1 P64M (SAE J518 CODE 61 - 2 1/2" 500 PSI)
- L1** - Drain port M26 x 1.5 (According to mounting position use upper port)

- L2** - Ventilation port for vertical mounting G 1/4" (Shaft upward)
- L3** - Oil filling 1 1/16" - 12 UNF
- MA** - Gauge port system pressure G 1/4"
- ...* - Connection with plug

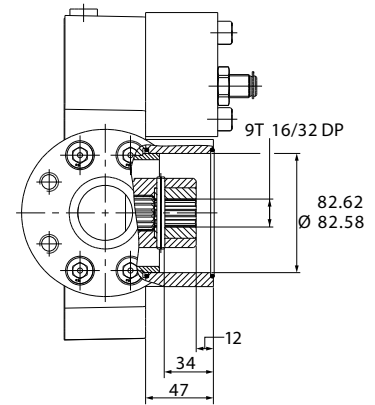
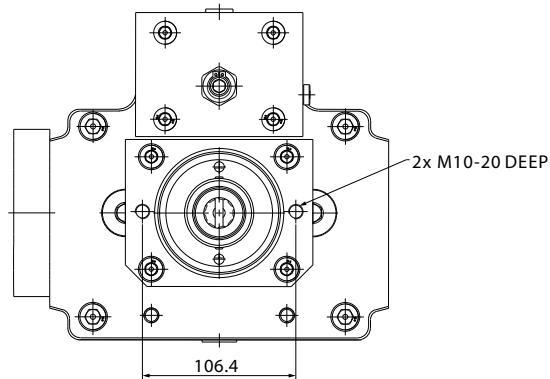
Thru-Drive Options

060 and 090 Series

All thru-drives accept DIN ISO 3019-2 (SAE J744) mounting interface.
Other thru-drive interfaces available on request.
For basic pump details, see general Installation Dimensions.

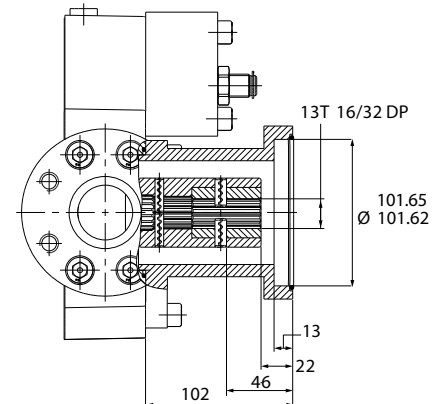
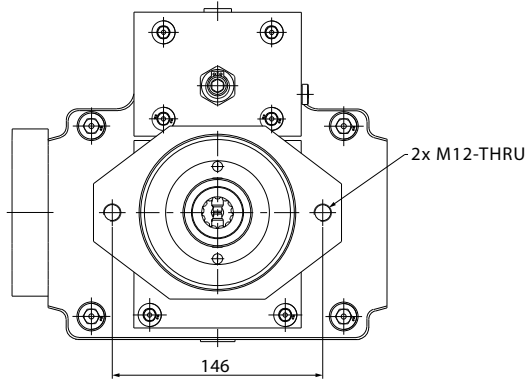
Option illustrated:

14 15 = 0A (SAE A)



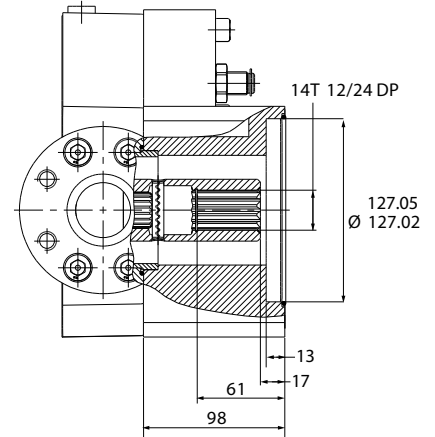
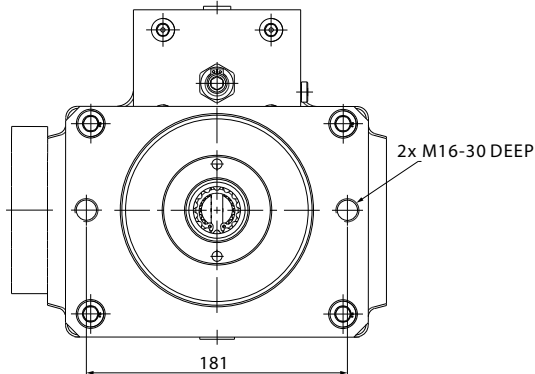
Option illustrated:

14 15 = 0B (SAE B)



Option illustrated:

14 15 = 0C (SAE C)



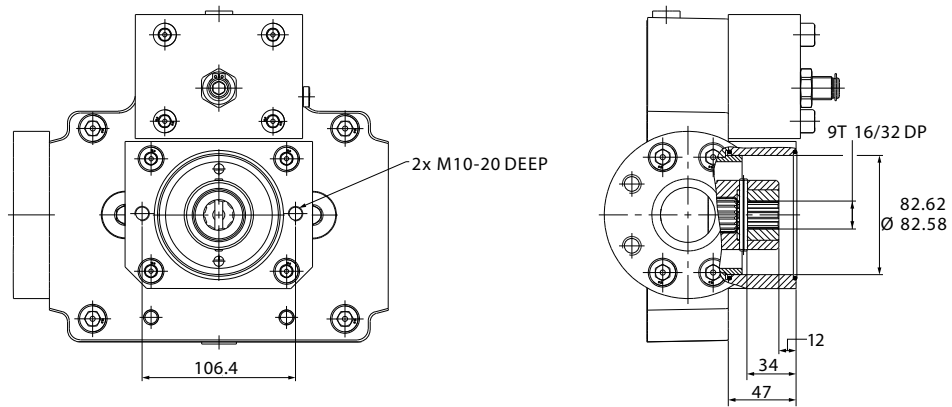
Thru-Drive Options

130 and 180 Series

All thru-drives accept DIN ISO 3019-2 (SAE J744) mounting interface.
Other thru-drive interfaces available on request.
For basic pump details, see general Installation Dimensions.

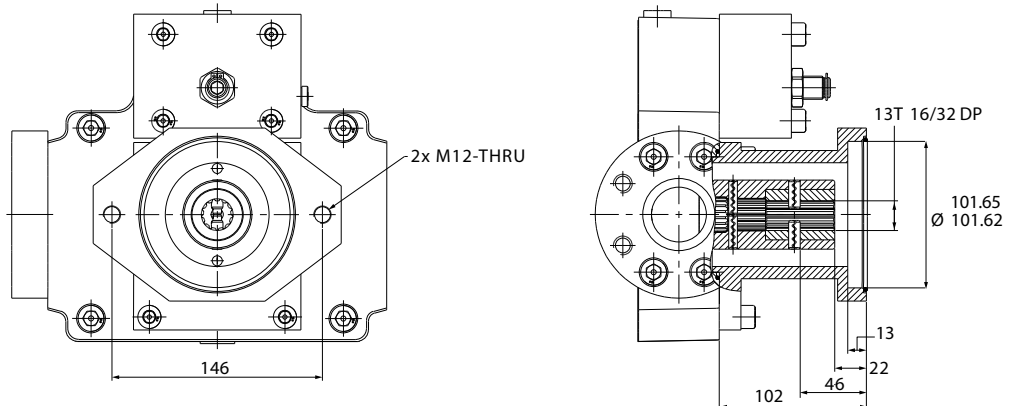
Option illustrated:

14 15 = 0A (SAE A)



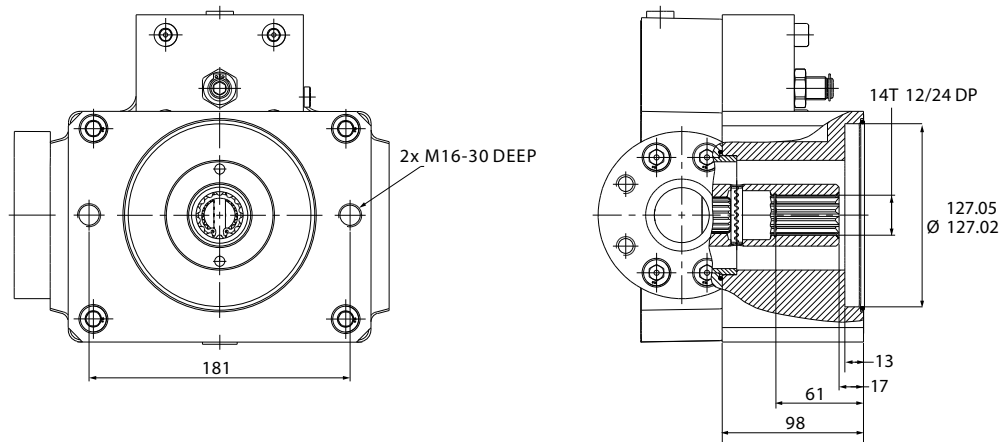
Option illustrated:

14 15 = 0B (SAE B)



Option illustrated:

14 15 = 0C (SAE C)



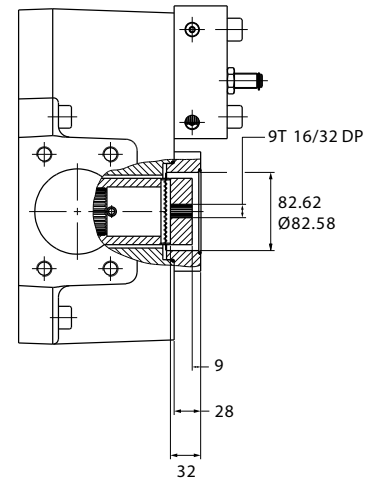
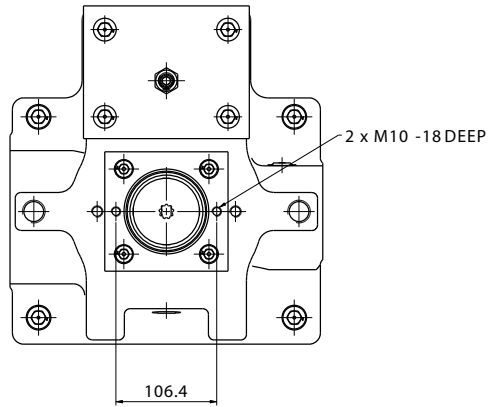
Thru-Drive Options

250 Series

All thru-drives accept DIN ISO 3019-2 (SAE J744) mounting interface.
Other thru-drive interfaces available on request.
For basic pump details, see general Installation Dimensions.

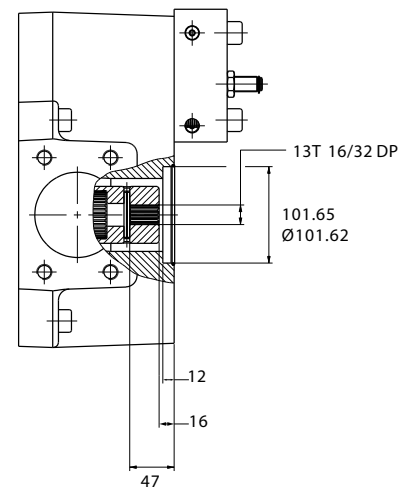
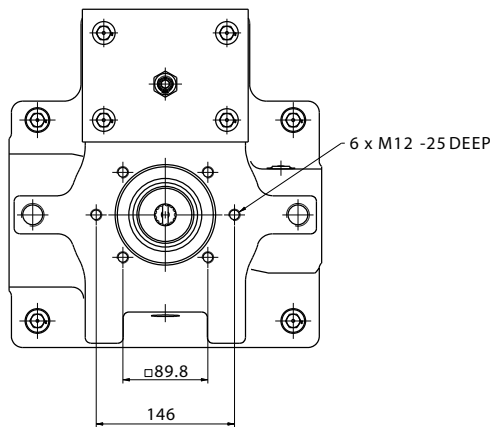
Option illustrated:

14 15 = 0A (SAE A)



Option illustrated:

14 15 = 0B (SAE B)



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- Gear pumps
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