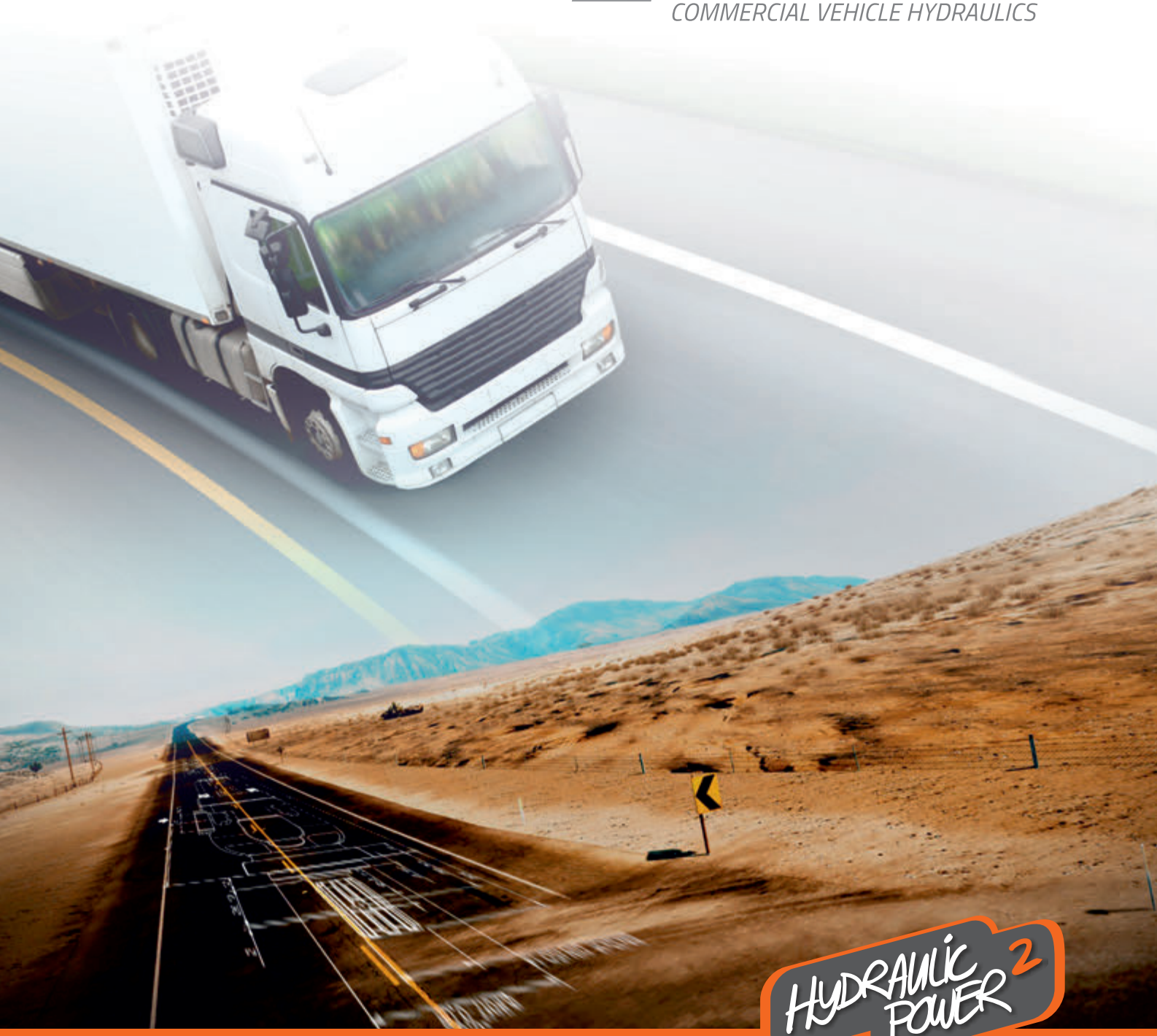
Hpi Hydro Power Industries

COMMERCIAL VEHICLE HYDRAULICS



HYDRAULIC POWER 2

CATALOGUE

Edition 6

CONTENTS

	PAGE
PISTON PUMPS 4 AND 3 BOLT	3
BENT AXIS PISTON PUMPS	4
40/30 SERIES GEAR PUMPS	5
TANDEM GEAR PUMPS	6
VANE PUMPS	7
ADAPTORS, COUPLINGS, FLANGES	8
TIPPING VALVES	9/10
CONTROL VALVES	11
SWITCHES	12
PTO'S	13
FILTERS AND ACCESSORIES	14
TANKS	15
FERRO BALL VALVES AND SWIVELS	16
FERRO COUPLERS	17/18
USEFUL FORMULAS PRESSURE CONVERSION, THREAD SIZES	19

Hpi Hydro Power Industries

COMMERCIAL VEHICLE HYDRAULICS

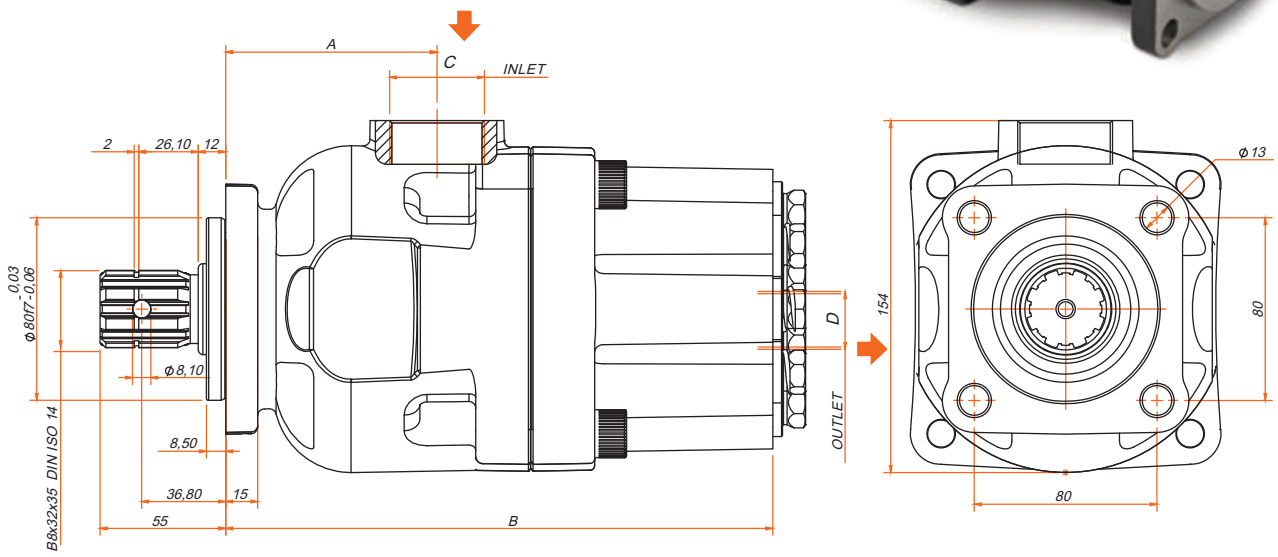
PISTON PUMPS

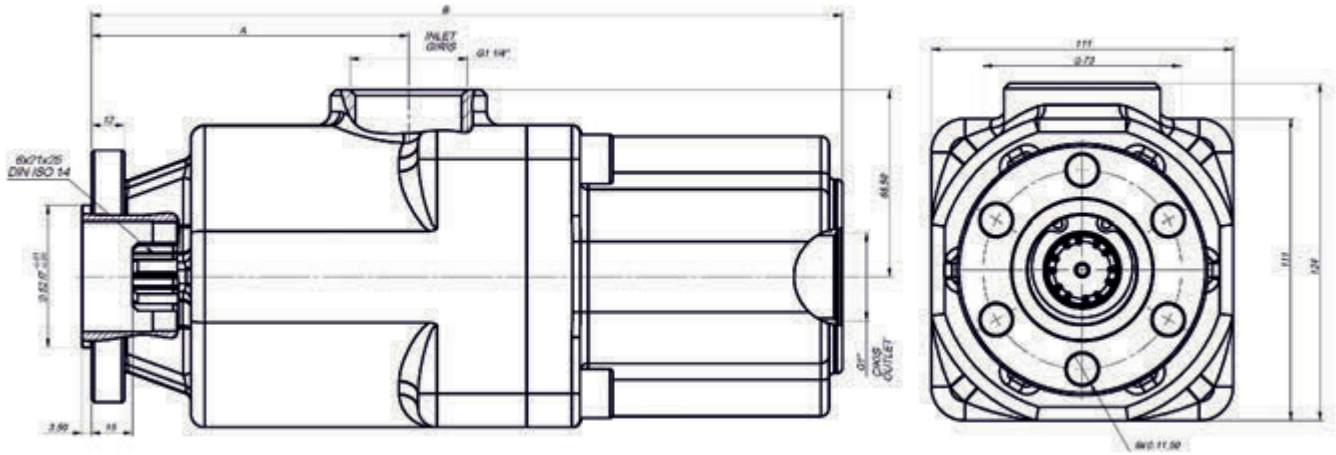
3 BOLT PISTON PUMPS (6 SPLINE)

Part Number	Max. Continuous Speed (min -1)	Min Intermittent Speed (min -1)	Max. Continuous Pressure (BAR)	Pump Type
PPP20CC35M3	1200	400	350	20CC
PPP34CC35M3	1200	400	350	34CC
PPP46CC35M3	1200	400	350	50CC
PPP60CC35M3	1200	400	350	60CC

4 BOLT PISTON PUMPS (8 SPLINE)

Part Number	Max. Continuous Speed (min -1)	Min Intermittent Speed (min -1)	Max. Continuous Pressure (BAR)	Pump Type
PPP16CC25M	1200	400	350	16CC
PPP20CC35M	1200	400	350	20CC
PPP32CC35M	1200	400	350	32CC
PPP50CC25M	1200	400	250	50CC
PPP50CC35M	1200	400	350	50CC
PPP60CC35M	1200	400	350	60CC
PPP80CC28M	1200	400	280	80CC
PPP106CC28M	1200	400	280	106CC

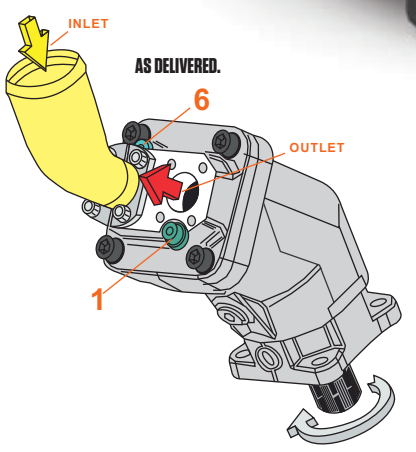


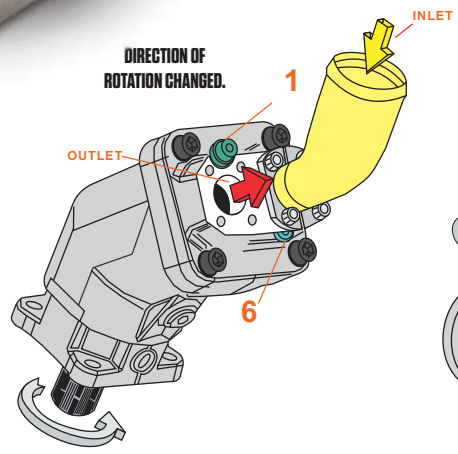


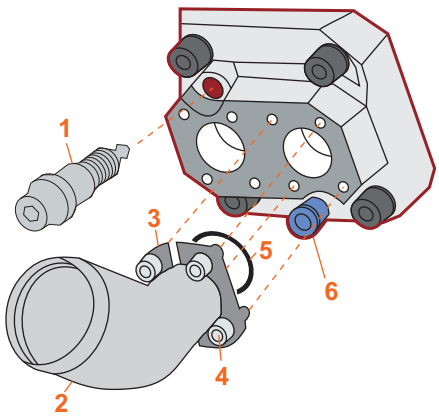
BENT AXIS PISTON PUMPS

BENT AXIS PISTON PUMPS

Part No	Pump Type	Displacement 100 Rpm	Max. Continuous Speed (min -1)	Min Intermittent Speed (min -1)	Max. Continuous Pressure (BAR)	Max Peak Pressure (Bar)	Weight Kg
2PBA-12	12CC	12.00	2300	3100	350	400	9.40
2PBA18	18CC	18.00	2300	2900	350	400	9.40
2PBA25	25CC	25.00	2300	2700	350	400	9.90
2PBA40	40CC	40.20	1900	2500	350	400	10.90
2PBA55	56CC	56.40	1900	2300	350	400	11.90
2PBA63	63CC	63.00	1900	2300	350	400	11.90
2PBA80	80CC	80.00	1700	2100	350	400	15.40
2PBA105	108CC	108.40	1700	1900	350	400	15.90
2PBA130	130CC	129.80	1700	1500	350	400	16.30







HOW TO CHANGE THE DIRECTION OF ROTATION OF THE PUMP

To check in which direction the pump should rotate on your installation:
- Check the direction of rotation of the PTO;
- If the PTO turns clockwise, the pump must rotate counter-clockwise, and vice versa.

To change the direction of rotation of your 2PBA pump:
- Remove the inlet fitting (2) and the 2 parts of the split flange (3).
- Remove the rotation setting screw (1).
- Remove the plug (6).
- Put the rotation setting screw (1) where the plug (6) was, and the plug (6) where the rotation setting screw (1) was.
- Put seal (5) on the inlet fitting, then the inlet fitting on the side where the plug (6) is, and fix with the split flange. Tighten with the screws (4).

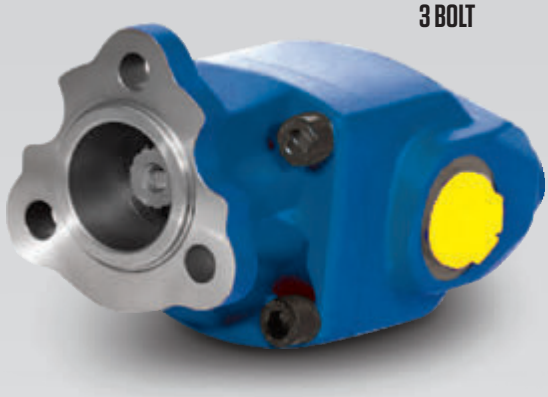
Important note:
Do not rotate pump shaft at all until the rotation setting screw (1) is in place. The rotation setting screw is always on the output (pressure) side.

20/30/40 SERIES GEAR PUMPS

20/30/40 SERIES GEAR PUMPS

Part Number	Pump Type	Displacement cm3/Rpm	Max. Continuous Speed (min -1)	Max. Continuous Pressure (BAR)	Weight Kg
DPAD30-17	30-17	17.20	2800	260	11.00
DPAD30-27	30-27	27.30	2800	260	11.50
DPAD30-34	30-34	33.80	2600	260	12.00
DPAD30-43	30-43	43.80	2300	260	12.50
DPAD30-51	30-51	51.70	2300	240	13.00
DPAD30-61	30-61	61.90	1900	220	13.50
DPAD30-82	30-82	82.10	1700	180	14.00
DPAD40-87	40-87	87.20	2600	240	18.00
DPAD40-109	40-109	109.00	2600	235	22.50
DPAD40-133	40-133	132.90	2400	225	23.50
DPAD40-151	40-151	151.00	2400	180	24.00

3 BOLT

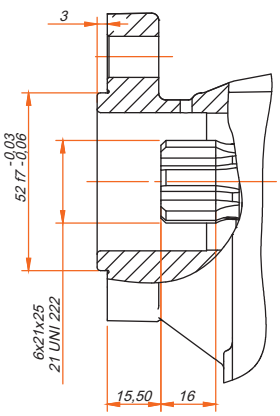


20/30/40 SERIES GEAR PUMPS

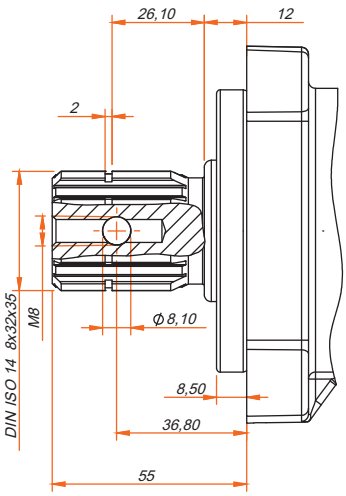
Part Number	Pump Type	Displacement cm3/Rpm	Max. Continuous Speed (min -1)	Max. Continuous Pressure (BAR)	Weight Kg
DP20-06BD	20-06	6.10	3000	280	4.0
DP20-10BD	20-10	10.20	3000	280	4.5
DP30-17	30-17	17.20	2500	260	10.50
DP30-27	30-27	26.50	2500	260	10.90
DP30-34	30-34	34.30	2200	260	11.40
DP30-43	30-43	43.70	2200	260	12.00
DP30-51	30-51	51.40	2000	240	12.50
DP30-61	30-61	60.80	1800	220	13.00
DP30-82	30-82	81.00	1500	180	13.80

3 BOLT

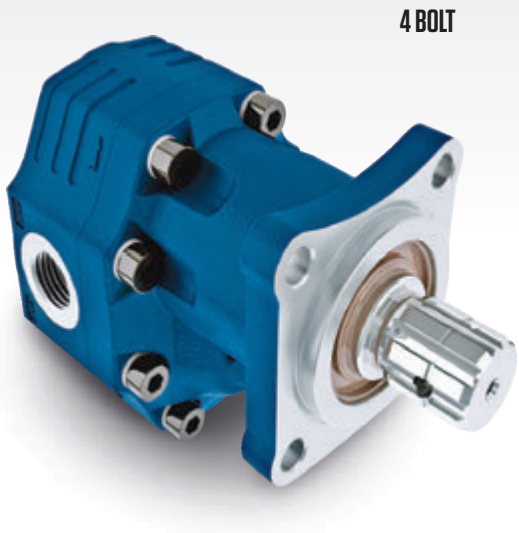
3 Bolt



4 Bolt



4 BOLT



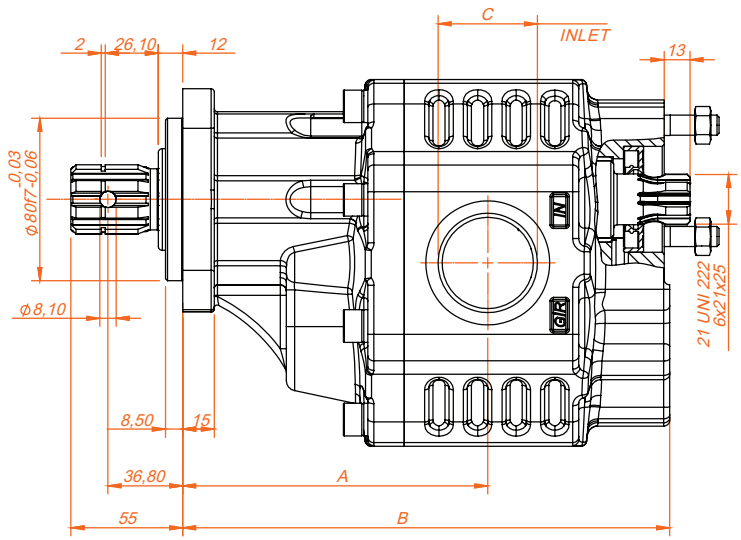
TANDEM GEAR PUMPS

PRIMARY PUMPS

Pump Type	Displacement cm3/Rpm	Max. Continuous Speed (min -1)	Max. Continuous Pressure (BAR)	Weight Kg
DPAD40-63	63	1500	240	16.30
DPAD40-73	73	1500	240	16.80
DPAD40-87	87	1300	210	17.50
DPAD40-109	109	1200	190	18.00

FINAL PUMPS

Pump Type	Displacement cm3/Rpm	Max. Continuous Speed (min -1)	Max. Continuous Pressure (BAR)	Weight Kg
DP30-17	17	1500	260	10.50
DP30-27	27	1500	260	10.90
DP30-34	34	1500	260	11.40
DP30-43	43	1500	240	12.00
DP30-51	51	1500	220	12.50
DP30-61	61	1500	200	16.30
DP40-63	63	1500	220	17.50



AVAILABLE IN 3 BOLT ON REQUEST

VANE PUMPS

DOUBLE & SINGLE VANE PUMPS

Part Number	Description	CC Per Rev	Max. Pressure (BAR)	Min/Max. Speed (RPM)
VP 70-70 R/L	Double Vane	70+70	240	400-2500
VP 78-34 R/L	Double Vane	78+34	210	400-2500
VP 26 R/L	Single Vane	26	210	400-2500
VP 34 R/L	Single Vane	34	210	400-2500
VP 55 R/L	Single Vane	55	210	400-2500
VP 63 R/L	Single Vane	63	210	400-2500
VP 80 R/L	Single Vane	80	210	400-2500

ODF VANE PUMPS

The design of the ODF vane pumps makes them particularly suitable for applications on trucks, especially vehicles operating with hydraulic motors, like feed bulkers, fuel tankers etc. All the components subject to wear, are contained in a cartridge unit that can easily be removed for inspection and/or replacement without disconnecting the pump from the circuit. This drastically reduces expensive downtime. The vanes ensure a more lamina flow instead of the more turbulent (pulsating) flow from a piston pump, which is perfect for hydraulic motors, resulting in extending the life and increasing efficiency.

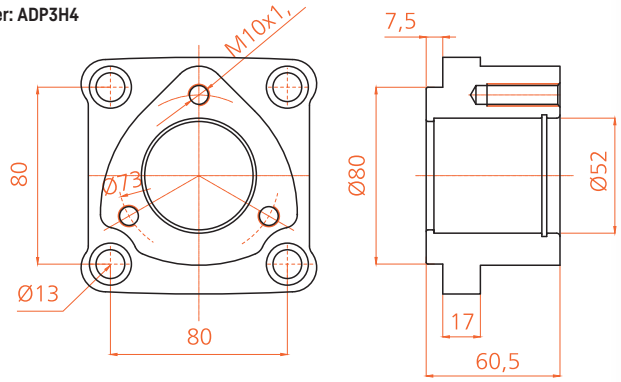
The special design of the double-lip vanes renders the ODF vane pumps ideally suitable for applications that require high pressure levels and very low noise emissions. Furthermore, the two opposed pumping chambers formed by the elliptical profile of the cam, cancel out radial loads which dramatically reduces vibrations and increases the pump's lifespan considerably. In addition to reliability, the ODF pump guarantees continuous high volumetric efficiency during its whole service time. This diminishes the requirement to compensate for the typical efficiency loss of other kinds of pumps, that increases the truck engine RPM, which in turn causes increased fuel consumption, air pollution, fuel cost and engine wear etc. Such characteristics, along with an extremely low noise-level, make ODF pumps environmentally friendly in line with the latest ecological trend. The pumps are extremely compact and are supplied with different types of either ISO or UNI norm mountings, for direct coupling with PTO and SAE norm hydraulic fittings. This, together with the ability to orientate the inlet and outlet ports, make ODF pumps very easy to install and guarantees their interchangeability with other types of pumps.

OTHER SIZES (CC) AVAILABLE ON REQUEST.
AVAILABLE IN EITHER CLOCKWISE OR ANTI CLOCKWISE
STANDARD ISO 4 BOLT MOUNT 8 SPLINE SHAFT

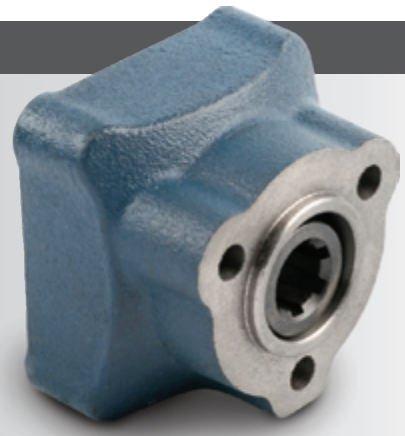
ADAPTORS

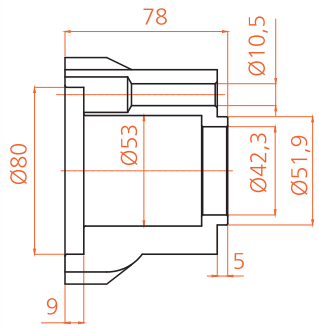
ISO ADAPTOR 4x3

Part Number: ADP3H4

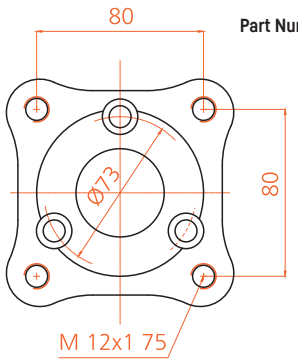


UNI ADAPTOR 3x4



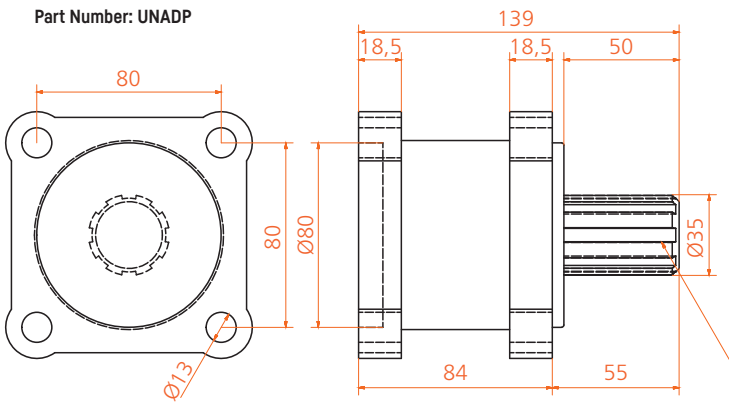


Part Number: ADP4H3

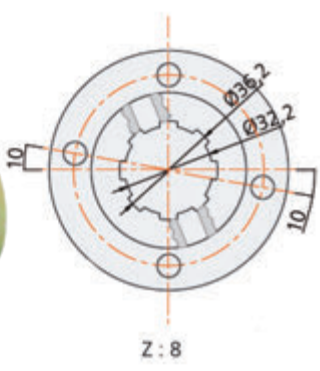


EXT ADAPTOR

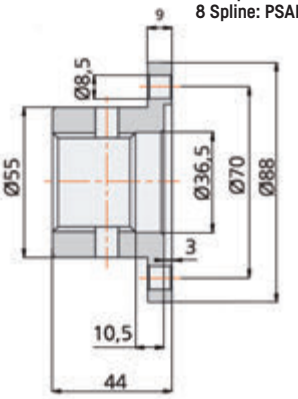
Part Number: UNADP



FLANGES



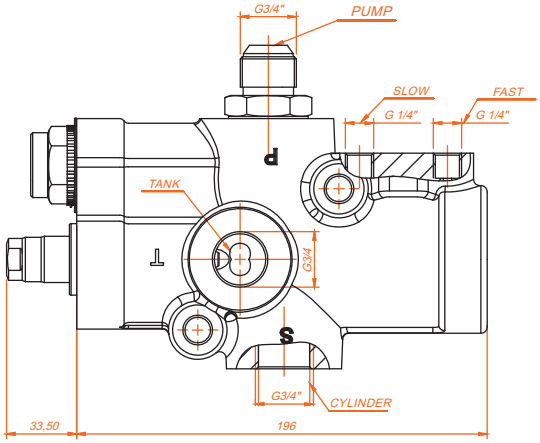
6 Spline: PSAF
8 Spline: PSAF1120

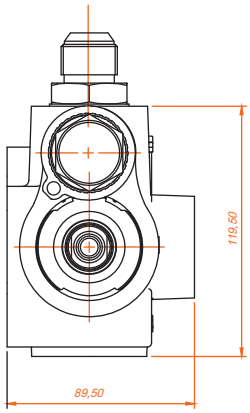


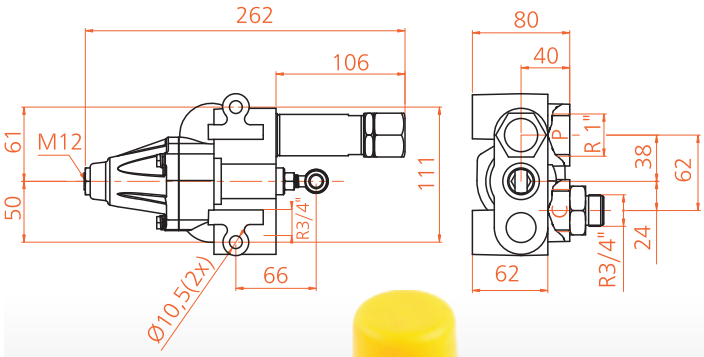
TIPPING VALVES

SINGLE ACTING TIPPING VALVE - SLOW DESCENT

Part Number	Flow Rate (L/Min)	Continuous Working Pressure (BAR)	Max. Continuous Pressure (BAR)	Weight Kg
SATV-12POLM	110	170	190	6.00







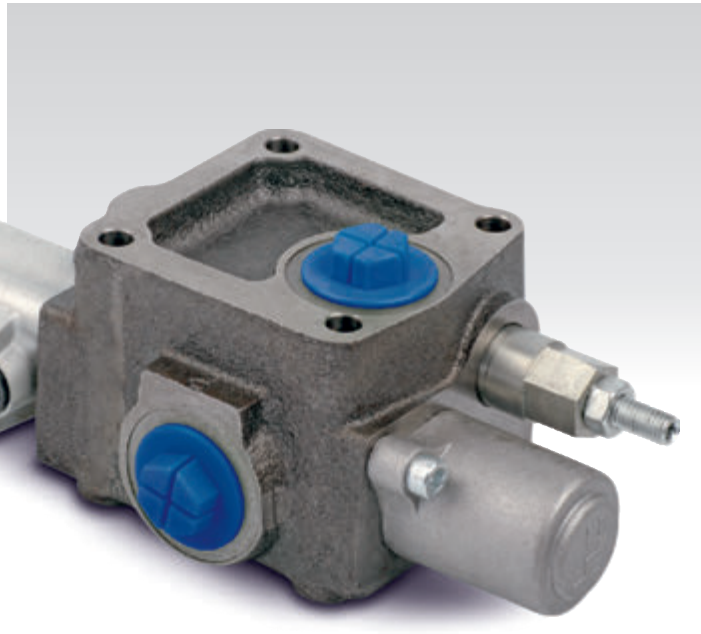
SINGLE ACTING TIPPING VALVES - DOP19 HIGH PRESSURE

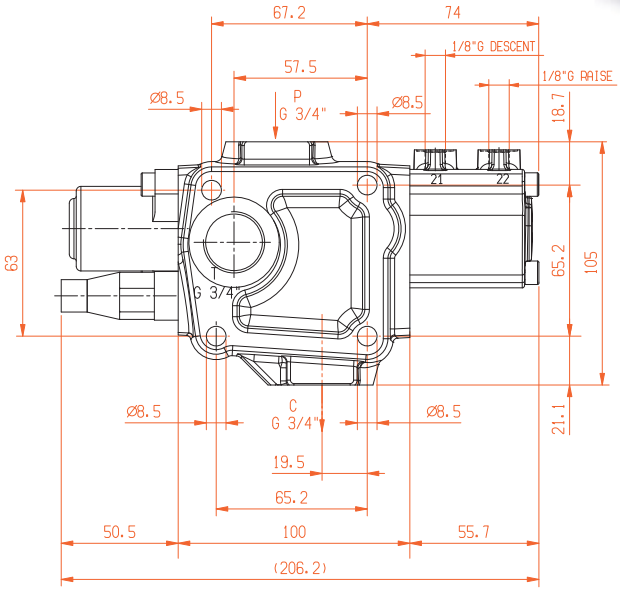
Part Number	Flow Rate (L/Min)	Continuous Working Pressure (BAR)	Max. Continuous Pressure (BAR)	Weight Kg
DOP19	140	170	190	5.00
DOP19H	140	250	260	5.00

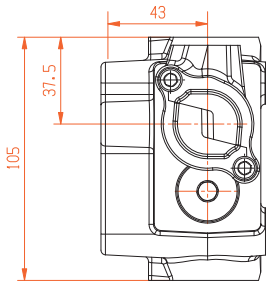
TIPPING VALVES

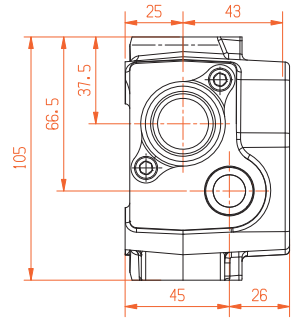
SINGLE ACTING TIPPING VALVE - WITH HOLDING POSITION

Part Number	Flow Rate (L/Min)	Continuous Working Pressure (BAR)	Max. Continuous Pressure (BAR)	Weight Kg
TP10	100	300	350	3.80



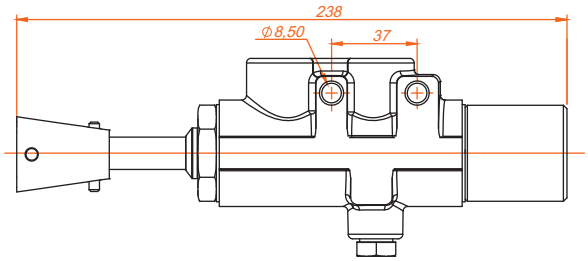


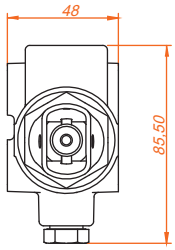


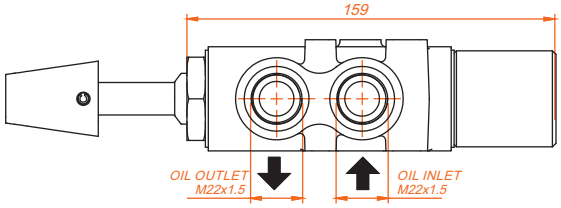


SINGLE ACTING TIPPING VALVE - MANUAL (MEILLER TYPE)

Part Number	Flow Rate (L/Min)	Continuous Working Pressure (BAR)	Max. Continuous Pressure (BAR)	Weight Kg
HYDV.MK	110	220	160	2.20





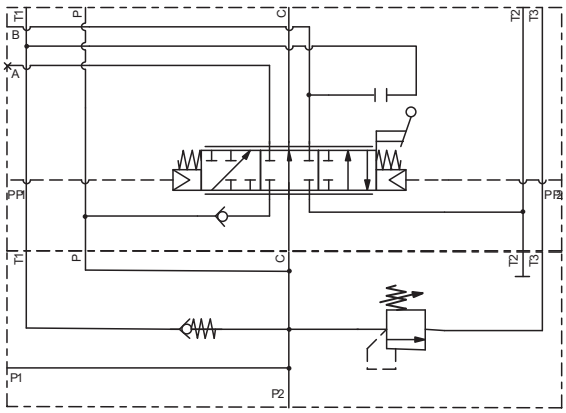


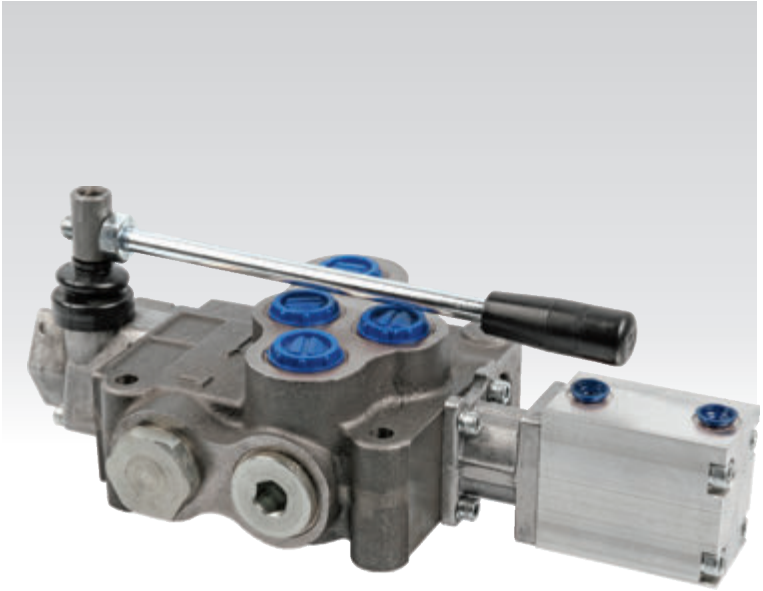
CONTROL VALVES

SINGLE SIDE TIPPER VALVE

Flow Rate (L/Min)	Continuous Working Pressure (BAR)	Max. Continuous Pressure (BAR)	Weight Kg
80	300	260	6.25

SINGLE SIDE TIPPER VALVE

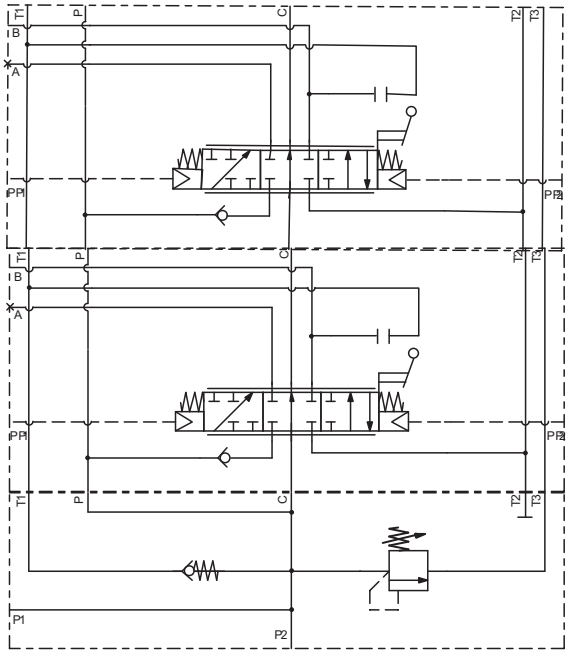




TWIN SIDE TIPPER VALVE

Flow Rate (L/Min)	Continuous Working Pressure (BAR)	Max. Continuous Pressure (BAR)	Weight Kg
80	300	260	8.95

TWIN SIDE TIPPER VALVE



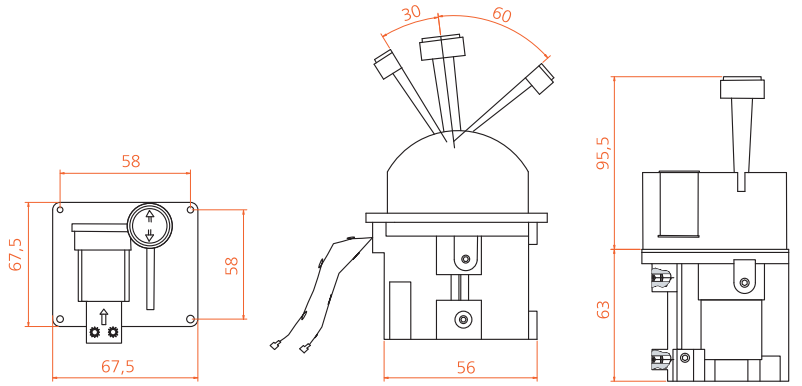
SWITCHES

PNEUMATIC AIR SWITCHES

Part Number	Type	Max. Pressure (BAR)	Port Size	Operations
CAC1	CAC1	10	1/8" BSP	SINGLE
43001002 (WITH LIGHT)	CAC2	10	1/8" BSP	DOUBLE

PNEUMATIC CAB CONTROL SWITCH

Part Number	Pneumatic Inlet	Pneumatic Outlet	Max. Pressure (BAR)	Min. Pressure (BAR)	Working Environment
CSPVA	G 1/8"	M5	12	5	PNEUMATIC



P.T.O FAIL SAFE SWITCH

Part Number	Pneumatic Inlet	Pneumatic Outlet	Max. Working Pressure (BAR)
PTOFSW	G 1/8"	G 1/8"	12

INSIDE CAB CONTROL VALVE

Part Number	Pneumatic Inlet	Pneumatic Outlet	Max. Working Pressure (BAR)
5/3WPV (spring return)	G 1/8"	G 1/8"	12
5/3WPVD (detent)	G 1/8"	G 1/8"	12

POWER TAKE OFFS

VARIOUS PTO'S AVAILABLE

FULLER BOTTOM MOUNT

EATON SIDEMOUNT PTO

EATON PTO EATON 6109-8209 FULLER PTO UNI 3 BOLT

FULLER BOTTOM MOUNT 4 BOLT PTO HEAVY DUTY

SCANIA PTO SCANIA PTO GRS900 3 BOLT (GRS900R)

EATON PTO FS828209 DOUBLE GEAR ISO FULLER PTO ISO 4 BOLT EATON OFFSET 4 bolt

ISUZU PTO ISUZU MLD6A ISUZU MBJ6T UNI PTO ISUZU MYY5T UNI - PTO MACHANICL CONTROL

ISUZU MYY5T UNI PTO MITSUBISHI PTO M3S5 MITSUBISHI PTO MERCEDES PTO

MERCEDES G85 OFFSET MERCEDES G85 SQUARE MERCEDES PTO G131/ 210/240/240/260/221 MERCEDES G3 PTO (SINGLE GEAR) MERCEDES G100 PTO

MERCEDES ACTROS 270MM INTR MERCEDES G4 PTO MERCEDES PTO G125 /210/240//255/260 NISSAN MLS62B ZF PTO

VOLVO SR62 COVER NISSAN PTO ZF OFF-SET PTO HEAVY DUTY SQUARE PTO ZF PTO MECHANIC CABLE CONTROL

ZF OFF-SET PTO DBL GEAR (HEM)

VOLVO SR1700 COVER CARDAN SHAFT PTO CABLE ZF S535 S636 DOUBLE GEAR 1/1.30 ZF S535 S636 SINGLE GEAR ALUM PTO ZF OFF-SET P.T.O CLOSED VOLVO PTO

FILTERS & ACCESSORIES

TANK MOUNTED FILTERS

Part Number	Size
TTF-34	3/4" BSP
TTF-100	1" BSP
TTF-114	1 1/4" BSP

SPIN ON FILTERS

Part Number	Size
SOF-34	3/4" BSP
SOF-114	1 1/4" BSP

AIR & FILLER BREATHERS

Part Number	Size
AB-12	1/2" BSP
AB-34	3/4" BSP
FB-2	52 mm

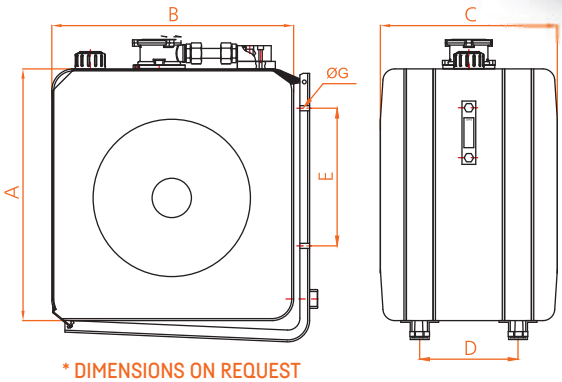
OIL LEVEL INDICATORS

Part Number	Size
LIT-1	76 mm
LIT-2	127 mm
LIT-3	254 mm

TANKS

SIDE MOUNTED TANKS

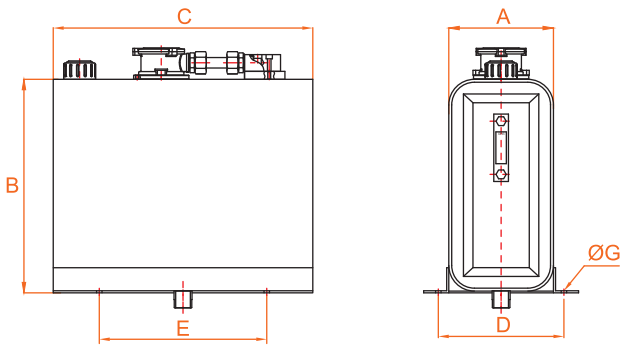
Tank Volume	Working Volume
80 LT	65 LT
100 LT	80 LT
120 LT	100 LT
160 LT	140 LT
190 LT	160 LT
210 LT	180 LT
256 LT	230LT



* DIMENSIONS ON REQUEST

BEHIND CAB TANKS

Tank Volume	Working Volume
65 LT	55 LT
95 LT	75 LT
105 LT	90 LT
120 LT	100 LT
155 LT	135 LT
175 LT	150 LT
200 LT	180 LT
220 LT	190 LT
225 LT	190 LT
264 LT	230 LT
285 LT	250 LT



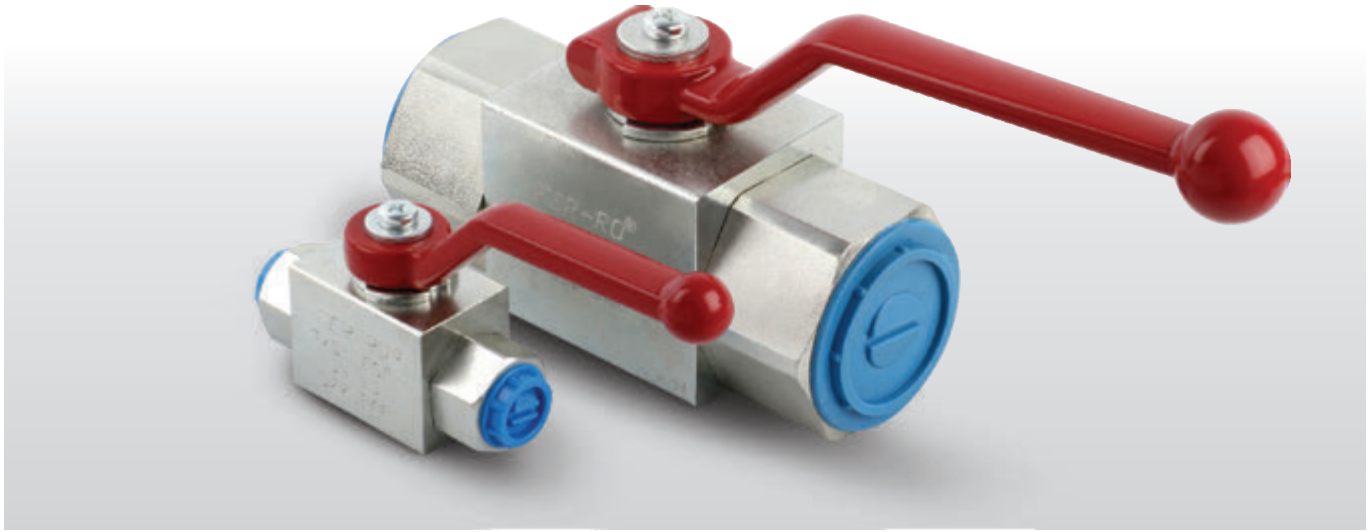
* DIMENSIONS ON REQUEST

ALL TANKS ARE SUPPLIED WITH AIR BREATHER,
TANK MOUNTED RETURN FILTER AND OIL LEVEL INDICATOR

FERRO BALL VALVES AND SWIVELS

BALL VALVES

Part Number	Description	Thread Size	Working Pressure (BAR)
BV2-04FB	1/4" BSP Female HP Ball Valve	1/4"	500
BV2-06FB	3/8" BSP Female HP Ball Valve	3/8"	500
BV2-08FB	1/2" BSP Female HP Ball Valve	1/2"	500
BV2-12FB	3/4" BSP Female HP Ball Valve	3/4"	500
BV2-16FB	1" BSP Female HP Ball Valve	1"	500
BV2-20FB	1 ¼" BSP Female HP Ball Valve	1 ¼"	500
BV2-24FB	1 ½" BSP Female HP Ball Valve	1 ½"	500
BV2-32FB	2" BSP Female HP Ball Valve	2"	500



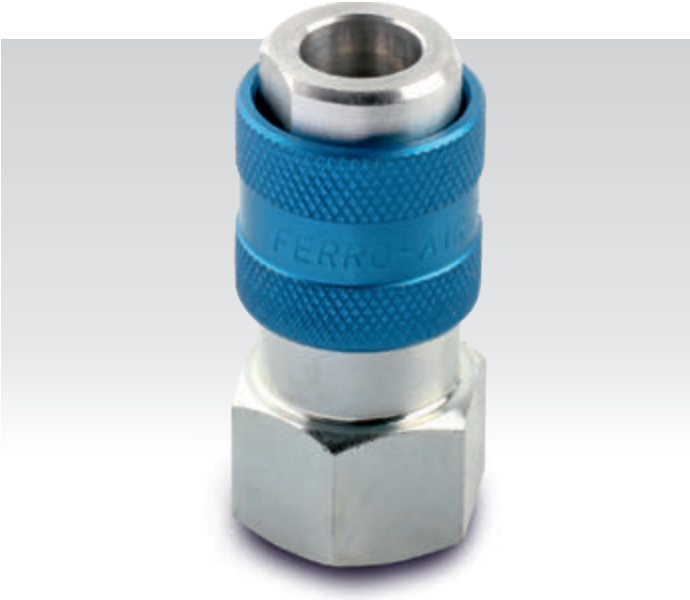
INLINE SWIVEL JOINTS

Part Number	Thread Size	Working Pressure (BAR)
SJ-04	1/4" BSP	450
SJ-06	3/8" BSP	430
SJ-08	1/2" BSP	400
SJ-12	3/4" BSP	380
SJ-16	1" BSP	340
SJ-20	1 ¼" BSP	300
SJ90-04	1/4" BSP	450
SJ90-06	3/8" BSP	430
SJ90-08	1/2" BSP	400
SJ90-12	3/4" BSP	380
SJ90-16	1" BSP	340
SJ90-20	1 ¼" BSP	300

FERRO COUPLERS

PNEUMATIC FEMALE COUPLERS (COMPATIBLE WITH RECTUS TYPE 26)

Part Number	Description
PCF25-04MB	Pneumatic Female Coupler 1/4" BSP Male
PCF25-06MB	Pneumatic Female Coupler 3/8" BSP Male
PCF25-08MB	Pneumatic Female Coupler 1/2" BSP Male
PCF25-04FB	Pneumatic Female Coupler 1/4" BSP Female
PCF25-06FB	Pneumatic Female Coupler 3/8" BSP Female
PCF25-08FB	Pneumatic Female Coupler 1/2" BSP Female
PCF25/6M	Pneumatic Female Coupler 6mm Hose Tail
PCF25/8M	Pneumatic Female Coupler 8mm Hose Tail
PCF25/10M	Pneumatic Female Coupler 10mm Hose Tail
PCF25/13M	Pneumatic Female Coupler 13mm Hose Tail



PNEUMATIC MALE COUPLERS (COMPATIBLE WITH RECTUS TYPE 26)

Part Number	Description
PCM25-04MB	Pneumatic Male Coupler 1/4" BSP Male
PCM25-06MB	Pneumatic Male Coupler 3/8" BSP Male
PCM25-08MB	Pneumatic Male Coupler 1/2" BSP Male
PCM25-04FB	Pneumatic Male Coupler 1/4" BSP Female
PCM25-06FB	Pneumatic Male Coupler 3/8" BSP Female
PCM25-08FB	Pneumatic Male Coupler 1/2" BSP Female
PCM25/6M	Pneumatic Male Coupler 6mm Hose Tail
PCM25/8M	Pneumatic Male Coupler 8mm Hose Tail
PCM25/10M	Pneumatic Male Coupler 10mm Hose Tail
PCM25/13M	Pneumatic Male Coupler 13mm Hose Tail

PIN TYPE QUICK COUPLERS

Part Number	Description	Thread Size	Working Pressure (BAR)
QCPT-04FB/MB	1/4" BSP Pin Type Quick Coupler M/F	1/4"	350
QCPT-06FB/MB	3/8" BSP Pin Type Quick Coupler M/F	3/8"	330
QCPT-08FB/MB	1/2" BSP Pin Type Quick Coupler M/F	1/2"	320
QCPT-12FB/MB	3/4" BSP Pin Type Quick Coupler M/F	3/4"	280
QCPT-16FB/MB	1"' BSP Pin Type Quick Coupler M/F	1"	250
QCPT-20FB/MB	1 ¼" BSP Pin Type Quick Coupler M/F	1 ¼"	230
QCPT-24FB/MB	1 ½" BSP Pin Type Quick Coupler M/F	1 ½"	220
QCPT-32FB/MB	2" BSP Pin Type Quick Coupler M/F	2"	200

FERRO COUPLERS

FLAT FACE QUICK COUPLERS

Part Number	Description	Thread Size	Working Pressure (BAR)
QCFF-04FB/MB	1/4" BSP Flat Face Quick Coupler M/F	1/4"	400
QCFF-06FB/MB	3/8" BSP Flat Face Quick Coupler M/F	3/8"	370
QCFF-08FB/MB	1/2" BSP Flat Face Quick Coupler M/F	1/2"	370
QCFF-12FB/MB	3/4" BSP Flat Face Quick Coupler M/F	3/4"	350
QCFF-16FB/MB	1" BSP Flat Face Quick Coupler M/F	1"	330

TEST POINTS (COMPATIBLE WITH RECTUS TYPE 26)

Part Number	Description
MTC-02MB	1/8" BSP Test Point Male
MTC-04MB	1/4" BSP Test Point Male
MTC-06MB	3/8" BSP Test Point Male
MTC-02MN	1/8" NPT Test Point Male
MTC-04MN	1/4" NPT Test Point Male
MTC-06MN	3/8" NPT Test Point Male

Part Number	Description	Thread Size
MTC 06L/S	06L/S Test Point Female	M12/M14
MTC 08L/S	08L/S Test Point Female	M14/M16
MTC 10L/S	10L/S Test Point Female	M16/M18
MTC 12L/S	12L/S Test Point Female	M18/M20
MTC 16S	16S Test Point Female	M24
MTC 20S	20S Test Point Female	M30
MTC 25S	25S Test Point Female	M36
MTC 30S	30S Test Point Female	M42
MTC 38S	38S Test Point Female	M52
MTC 15L	15L Test Point Female	M22
MTC 18L	18L Test Point Female	M26
MTC 22L	22L Test Point Female	M30
MTC 28L	28L Test Point Female	M36
MTC 35L	35L Test Point Female	M42
MTC 42L	42L Test Point Female	M52

KINDLY NOTE THAT ALL COUPLERS CAN BE SOLD AS A SET OR SEPARATELY AS MALE OR FEMALE

IDENTIFYING THREAD SIZES

BSP threads

Dash	Size-TPI	oD	iD
2	1/8"-28	9.7	8.6
4	1/4"-19	13.2	11.4
6	3/8"-19	16.7	15
8	1/2"-14	21	18.6
10	5/8"-14	22.9	20.6
12	3/4"-14	26.4	24.1
16	1"-11	33.3	30.3
20	11/4"-11	41.9	39
24	11/2"-11	47.8	44.9
32	2"-11	59.6	56.7

ORFS threads

Dash	Size-TPI	oD	iD
4	9/16"-18	14.3	12.8
6	11/16"-16	17.5	15.7
8	13/16"-16	20.8	18.9
10	1"-14	25.4	23.4
12	1 3/16"-12	30.2	27.9
16	1 7/16"-12	36.5	34.2
20	1 11/16-12	42.9	40.6
24	2"-12	50.8	48.5

NPT threads

Dash	Size-TPI	oD	iD
2	1/8"-27	10.2	8.7
4	1/4"-18	13.6	11.4
6	3/8"-18	17.1	14.8
8	1/2"-14	21.3	18.3
12	3/4"-14	26.6	23.6
16	1"-11.5	33.3	29.7
20	11/4"-11.5	42	38.4
24	11/2"-11.5	48.1	44.5
32	2"-11.5	60.1	56.5

JIC/SAE/UNF threads

Dash	Size-TPI	oD	iD
4	7/16"-20	11.1	9.7
5	1/2"-20	12.7	11.3
6	9/16"-18	14.3	12.8
8	3/4"-16	19.1	17.3
10	7/8"-14	22.2	20.3
12	1 1/16"-12	27	24.7
14	1 3/16"-12	30.2	27.9
16	1 5/16"-12	33.3	31
20	1 5/8"-12	41.3	39
24	1 7/8"-12	47.6	45.3
32	2 1/2"-12	63.5	61.5

USEFUL FORMULAS

1. CYLINDER AREA= $\dfrac{\text{Tons x 1000 x 9.81}}{\text{Mpa (Working pressure)}}$

Area=mm²
Mpa= Working Pressure

2. PISTON DIAMETER = $\sqrt{\dfrac{\text{Area x 4}}{\pi}}$

Diameter = mm
Area = mm²
π = 3.142

3. PUMP FLOW RATE: $Q = A \times V \times 10^{-6}$

Q = Litres / min
A = Piston area
V = Cylinder / piston speed in mm / min
10^{6} is the same as dividing by 1000 000

4. MOTOR KILOWATT: $KW = \dfrac{\text{Mpa x Liters / Min}}{60}$

KW = Kilowatt
Mpa = Relief Valve Pressure
Litres / min = Pump Flow Rate

5. SUCTION LINE DIAMETER: $DIA = \sqrt{\dfrac{Q \times 21{,}22}{V}}$

DIA = mm (D)
Q = Pump Flow Rate
V =1m / sec

6. PRESSURE LINE DIAMETER: $DIA = \sqrt{\dfrac{Q \times 21{,}22}{V}}$

DIA = mm
Q = Pump Flow Rate
V = Recommended Fluid Velocity Starting at 4,5 m/sec
(Check Reynolds Number Refer.7)

7. CHECK REYNOLDS NUMBER (Re): $Re = \dfrac{V \times D \times 1000}{cSt}$

V = Fluid Velocity in m / sec
D = Pipe I.D. in mm
cSt =Centistoke, use 46 cSt
Reynolds number must be <2500

8. PISTON AREA TO ANNULUS AREA RATIO:

$RATIO = \dfrac{D^2}{D^2 - d^2}$

D = Piston DIA
d = Rod dia

9. RETURN LINE FLOW RATE:

Q = Ratio x Pump Flow Rate

10. RETURN LINE DIAMETER: $DIA = \sqrt{\dfrac{Q \times 21{,}22}{V}}$

DIA = mm
Q = Area Ratio x Pump Flow Rate
V = Fluid Velocity (Starting at 3m / sec)

11. DIRECTIONAL CONTROL VALVE FLOW RATE:

Litres / min = Cylinder Area Ratio x Pump Flow Rate

12. RETURN LINE FILTER SIZE:

=Cylinder Area Ratio x Pump Flow Rate

13. CONVERT CC TO LITRES/MIN:

$FLOW = \dfrac{\text{CC/PER REV X RPM (OF DRIVE)}}{1000}$

14. HYDRAULIC MOTOR TORQUE

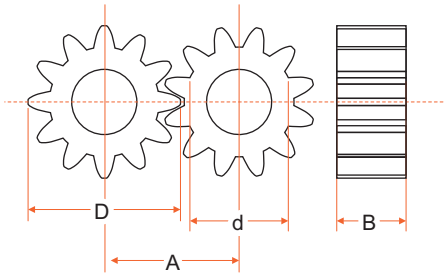
$Torque = \dfrac{P \times CC}{2\pi}$

15. HYDRAULIC MOTOR K.W

$K.W = \dfrac{\text{TORQUE X RPM}}{9550}$

FLOW CAPACITY

How to work out approximate flow capacity of a gear pump in cm3 per revolution.



FORMULA: Using two gears
Note: all dimensions in mm ÷ by 1000 to get cc/rev.
A = centre to centre of shafts
B = gear width
D = gear OD
d = gear ID

EXAMPLE:
1.3682 x A x B x (D - d)
1.3682 x 44.3 x 32 x (53.3 - 33.5)
= 38403.2 ÷ by 1000 to get cc/rev.
38.4 cc/rev.

Hpi Hydro Power Industries

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