Program Book / Guidelines for Parker Hannifin Hydraulics

Document No: CL-F-Parker Hydraulics

Version 1.0

Printed: September 01, 2017

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Any questions or comments with respect to this specification should be directed to the project engineer for the specific project in question.

The Version 1.0 based on the initial release of Version E3.0, 2015

Original Date	Version No.	Document Name	Revision	Paragraph Affected	Authored By
2017-09-01	1.0	CL-F-Parker Hydraulics	Version 1.0: Adaptation due to transition to PSA Group		Parker Hannifin T. Kendziorra

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1. INTRODUCTION

1.1 SCOPE OF DOCUMENT

This program book proves a list of Parker Hannifin hydraulic products to be used for OPEL Automobile ME Propulsion Systems programs. (Further use OPEL in the document).

Parker Hannifin is an approved OPEL for all hydraulic products including pumps, cylinders, actuators, valves, filters, regulators, sensors, manifolds and reservoirs as well as other miscellaneous electrohydraulic components.

All miscellaneous hydraulic components should be selected according applications needs, under the guidance of the local Parker Hannifin applications engineer and with the approval of OPEL.

2. PROJECT CONTACT INFORMATION

	NORTH AMERICA	EUROPE	SOUTH AMERICA	CHINA	EAST ASIA
Company	**Parker Hannifin Corporation**	**Parker Hannifin Corporation**	**Parker Hannifin Ind.e Com. Ltda.**	**Parker Hannifin Corporation**	**Parker Hannifin Corporation**
Address	900 North Squirrel Road Suite 175 Auburn Hills, Michigan 48326	Pat-Parker Platz 1 D-41564 Kaarst, Germany	Estrada Municipal Joel de Paula 900 12247-004 Sao Jose dos Campos, SP	280 Yunqiao Rd. Jin Qiao Export Processing ZN Shanghai, China 201206	280 Yunqiao Rd. Jin Qiao Export Processing ZN Shanghai, China 201206
Website	www.parker.com	www.parker.com	www.parker.com	www.parker.com	www.parker.com
Local Support	Butch O'Brien	Thomas Kendziorra	Sergio Santana	Crystal Yu	Brad Manwaring
Office	+1 248-209-4936	+49-5665-969-0109	+55 (12) 4009 3500	+ 86 21 2899 4876	502-542-1130
Mobile	+1 248-561-2065	+49-175-575-6172	+55 (19) 8142 7291	+ 86 181 1622 3372	502-542-1130
Fax		+49-5665-969-0217			
E-Mail	eobrien@parker.com	thomas.kendziorra@parker.com	slsantana@parker.com	Crystal.yu@parker.com	bmanwaring@parker.com

3. PRODUCT OVERVIEW

The Parker Hannifin components recommended for OPEL programs are listed on the following pages. For additional information on Parker Hannifin Hydraulics, Filtration, and Fluid Connectors products please reference the websites listed below.

www.parker.com/hydraulics

www.parker.com/filtration

www.parker.com/fcg

www.parker.com/acde

3.1 HYDRAULIC POWER UNITS

Considerations in the design of the power unit are:
A) Sound Level: The complete power unit sound level must be below 75 dB(A).
B) Fluid Viscosity: The hydraulic fluid viscosity required for the application must not cause pump cavitation (see datasheet of components).

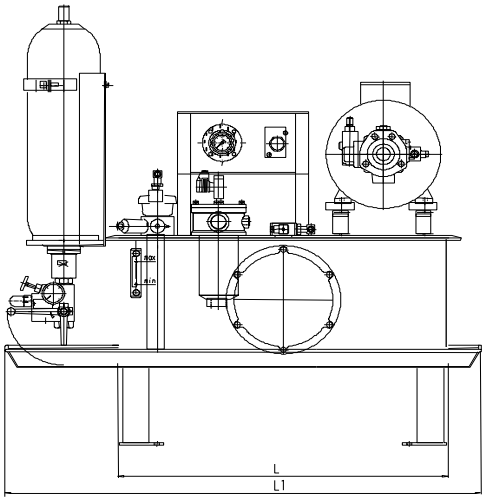
OPEL will approve the interior painting of reservoirs when the system is operating on mineral oil. Systems operating with fire resistant fluids will require lower operating temperatures and may require special seal material. In addition, the fluid selection may require that the reservoir interior not be painted but coated with a rust preventative. OPEL encourages the design of energy efficient hydraulic systems, which do not require heat exchangers.

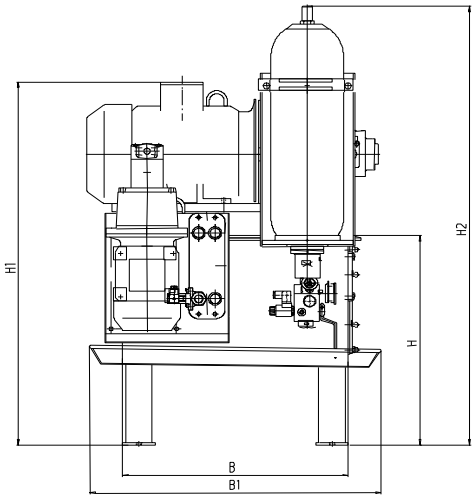
3.1.1 Horizontal Power Units

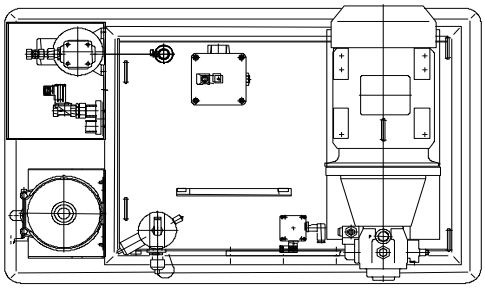
Horizontal power units for OPEL are available in four standard sizes: 100, 160, 250 & 400 Liters. Following pumps are approved for the main system -> see table on page 6 and 9.
Each power unit is equipped with an independent offline filtration circuit. Should a heat exchanger be required for an application (deviation request!), a plate style heat exchanger shall be added in the offline circuit. The power unit is equipped with both dual level and dual temperature switches. For maintenance purposes the pump case drain line will be tubed to the return side of the reservoir. Access to the reservoir will be through reservoir clean out covers. The clean out covers are fixed with a minimum of six studs to prevent cover leakage. Included with the power units are isolation / leveler pads. Should a bladder type accumulator be required for an application, it will be added to the power unit along with a lockable accumulator safety isolation block.

Sound Specification		Less than 75 dB(A)
Pumps	for main circuits	PD / PV / PVS pump type, DCP
	for cooling circuits	T6CMY pump type or QPM (pump motor combination)
Fluid		HPL 46 (recommended to DIN 51524-2)
Temperature range of the pressure liquid		-10 to +70 °C; Operating temperature max. 50 °C
Energy Saving		According SP-F Hydraulic, section 5.5
Option 1	Internal leakage < 0.5 l/min and on/off-cycle < 1/min	Accumulator charging circuit with intermittent service (electrical motor is off)
Option 2	Internal leakage ≥ 0.5 l/min or on/off-cycle ≥ 1/min	Electrical motor, controlled by frequency converter and direct pressure feedback Drive Controlled Pump (DCP)
Option 1	Intermittent service	
	E-Motor type	Three-phase current asynchronous motor;
	Design	B5 (exception Mini Powerpacks), PTC resistor, up to 5,5 kW (incl.) plug socket connector e.g. HAN10ESS till 7,5 kw
	Voltage	See SP-G-Machine Data
	Rotational nominal speed	1000-1500 min^{-1} at 50 Hz (for constant speed drive)
	Standard	IEC: IE3 > 0,75 kw
Option 2	**DCP (Drive Controlled Pump)**	
	E-Motor type	Three-phase current asynchronous motor; type FCA, FCM & 1LE
	Design	B35 (exception Mini Powerpacks), PTC resistor, plug socket connector e.g. HAN10ESS
	Voltage	See SP-G-Machine Data
	Standard	IEC; IE2 with Frequence converter
	DCP (Drive Controlled Pump)	
	E-Motor type	Three-phase current synchronous motor type MH & SMB
	Design	B5; IP64, PTC resistor, plug socket connector Interconnectron
	Voltage	See SP-G-Machine Data
	Rotational speed	up to 3300 min^{-1}
	Torque	up to 657 Nm
Painting		RAL 7035 light grey
Oil Filling (via return line filter)		Fill point at the power unit: • PARKER connector 60 series-steel H6-63-BSPP • PARKER dust plug, rubber type H6-66M
Filter		Return-line filter acc. DIN 24550
Cooling ***- with deviation request only !*** **Attention:** The oil temperature **should not exeed** the limit values **according to SP-F-Hyd**. Pre warning at 55°C; Cooling off at 48°C; Stop after finished cycle at 65°C		**Enviroment data and Cooling fluid:** See SP-G-Machine data Including: - Flow meter - Flow valve
Fluid-Control-Terminal		For monitoring for temperature, fluid level Parker SensoControl unit SCLTSD-xxx-00-07 has to be used.
Air breather		Environmental Air Filter series EAB has to be used with • Filter media ≤2µm • airflows up to 1000 l/min • Optional visual gauge type vacuum/pressure indicator • mounting holes for a padlock
Pressure gauge		• The measurement range of pressure indicator devices has to be ⅓ higher than the expected maximum pressure to be measured. • Scale in “bar”, second scale in “MPa” allowed • Operating range to be marked (green/red) by OEM
Pressure gauge selection valve		1 Measurement point, used as shut-off valve 5 or 10 Measurement points, without integrated pressure gauge (WM5A / WM10A)
Accumulator Safety Block		Lockable SBA-series for padlocks bar Ø ≤9mm

Hose assemblies	• Hose and fittings must be produced by the same manufacturer. • For the operating pressures >100 bar, the hoses should be equipped with hose whip restraint and also with hose splash protection according machine directive • Legible and durable marking on **both** fittings. • Legible and durable marking on hoses (both ends) with PTS (Parker Tracking System)
Hoses	• Hoses per ISO 1436 part 1 or according ISO 18752 (Parker Global Core hose series)
Ports	• Threaded ports: • ISO 1179-1/2/3 stud ends (G-thread acc. ISO 228) • Four-screw flange port connections: • ISO 6162 or ISO 6164 and ISO 6161-1
Tube & Fittings	Trivalent Chrome Parker EO2-series or EO2-Form series
Labeling – Minimum letter size 4 mm – secured by rivet or metallic drive screws	• Positioning acc. To SP-G-Specifics and Clarifications-E • All phrases in Local language and English • Service label for filter with specification of replacement filter element and sealing kit near the filter





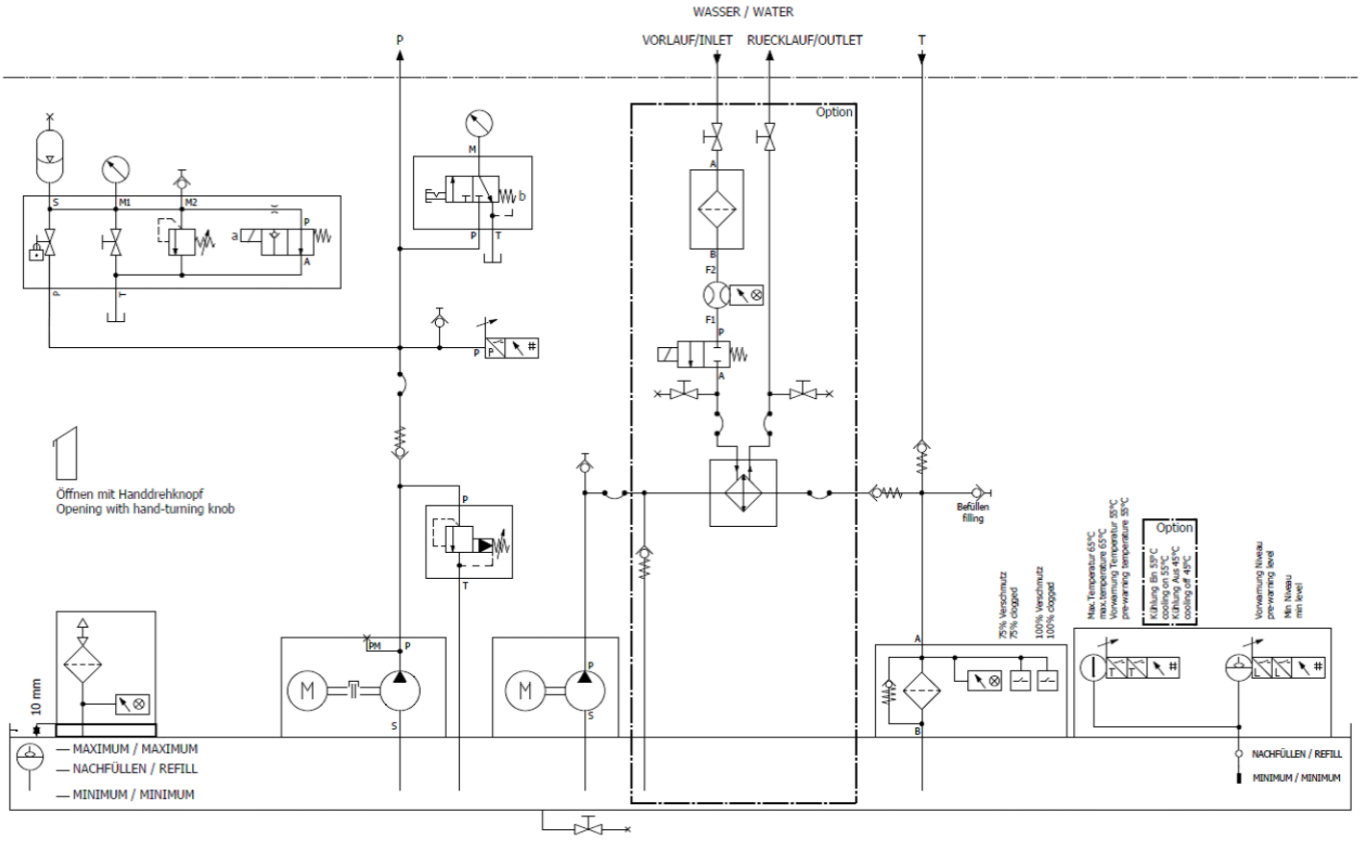


Reservoir Capacity	L1	B1	H1 **
100 Liter	1433	660	1060
160 Liter	1610	790	1080
250 Liter	1810	890	1080
400 Liter	2314	935	1260

****** H1 dimension is dependent on the size of the motor

Sound Spec: Less than 75 dB(A) Ports: ISO 1179-1 (G thread) Options: Accumulator circuit, heat exchanger circuit

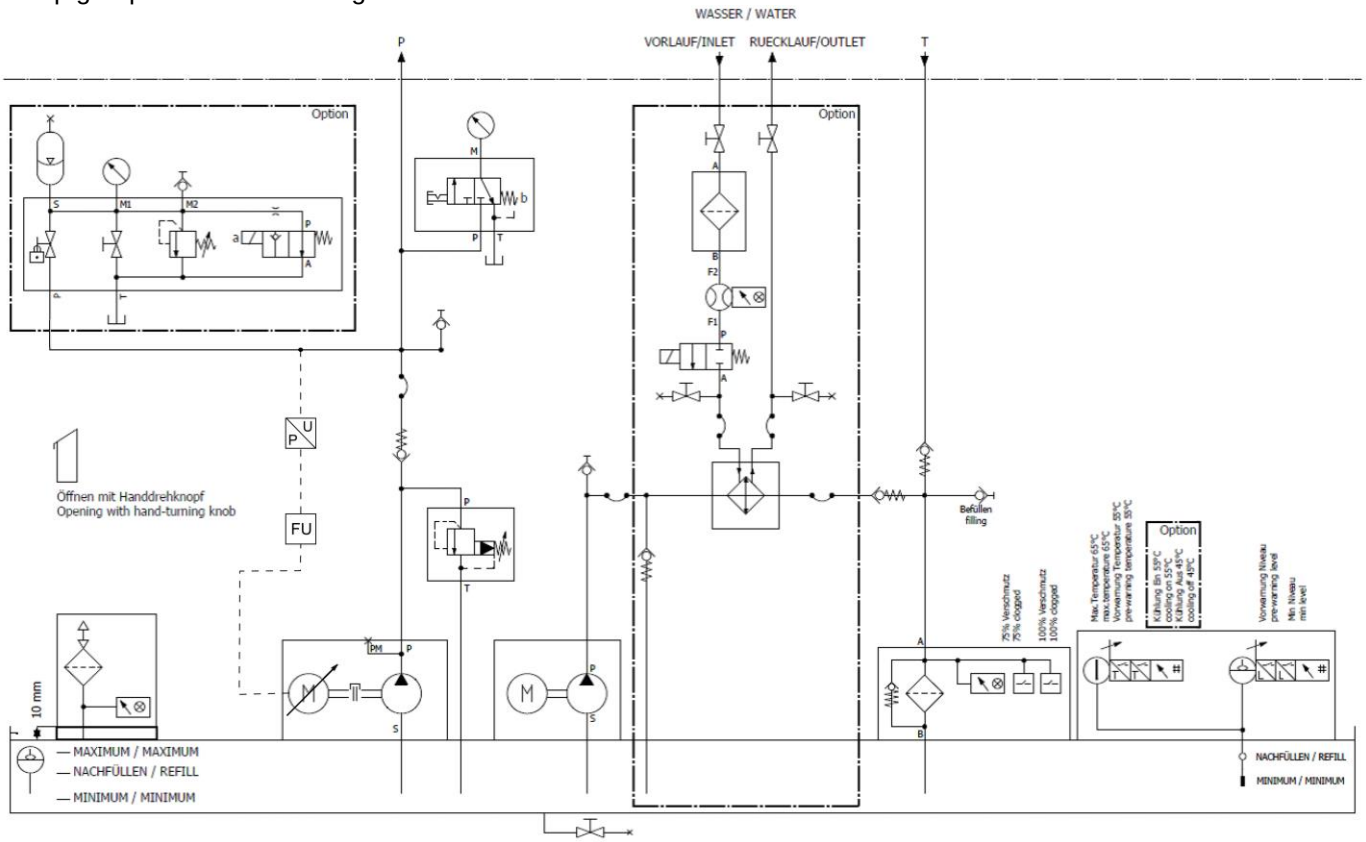
Option 1: Hydraulic system with accumulator charging circuit (pump group in horizontal design)



Fill point: H6-63 BSPP Labels: Per OPEL Spec. Tubing & Fittings: Trivalent Chrome metric flareless bite type fittings PARKER EO2

	100 L	160 L	250 L	400 L
Main Pump, Variable Displacement w/ solenoid unloading	PD / PV / PVS / DCP	PD / PV / PVS / DCP	PV / PVS / DCP	PV / PVS / DCP
Main Pump, Constant Displacement w/ solenoid unloading	T7	T7	T7	T7
Max. Flow @ 1000-1500 RPM	20 LPM	32 LPM	40 LPM	80 LPM
Pump Drive Speed	The electric motor drive speeds requires 1000-1500 RPM at 50Hz (Europe).			
Electric Motor	Three-phase current asynchronous motor B35 (except Compact Power Units); Harting-Plug allowed; according to IE3; IP65; PTC Resistor for all motors. The machine builder should confirm the OPEL plant location to determine the exact motor voltage requirements.			
Aux. Pump for offline filtration circuit	T6CMY QPM series (motor pump combination)			
Return Filter	DIN 24550 filters should be used for all regions.			
Level / Temperature Switch	Parker Hannifin combination level/temperature unit to be used: SCLTSD- xxx* -00-07 (xxx* = 250/370/520 mm, laid length)			
Pressure Switch	PN7071			

Option 2:
Hydraulic system with an electric motor, controlled by variable frequency drive and a direct pressure feedback.
Pump group in horizontal design



Drive Controlled Pump: A combination for speed controlled pump drives including:

- Motor-Pump combination, including
  - electric motor
  - pump
  - bell housing
  - coupling
- Frequency converter (for cabinet installation only - no piggyback on electric motor)
- The function for flow control combined with a closed loop pressure control is pre-selected in the drive and easy to configure by selecting parameters. The pressure sensor is not included.
-

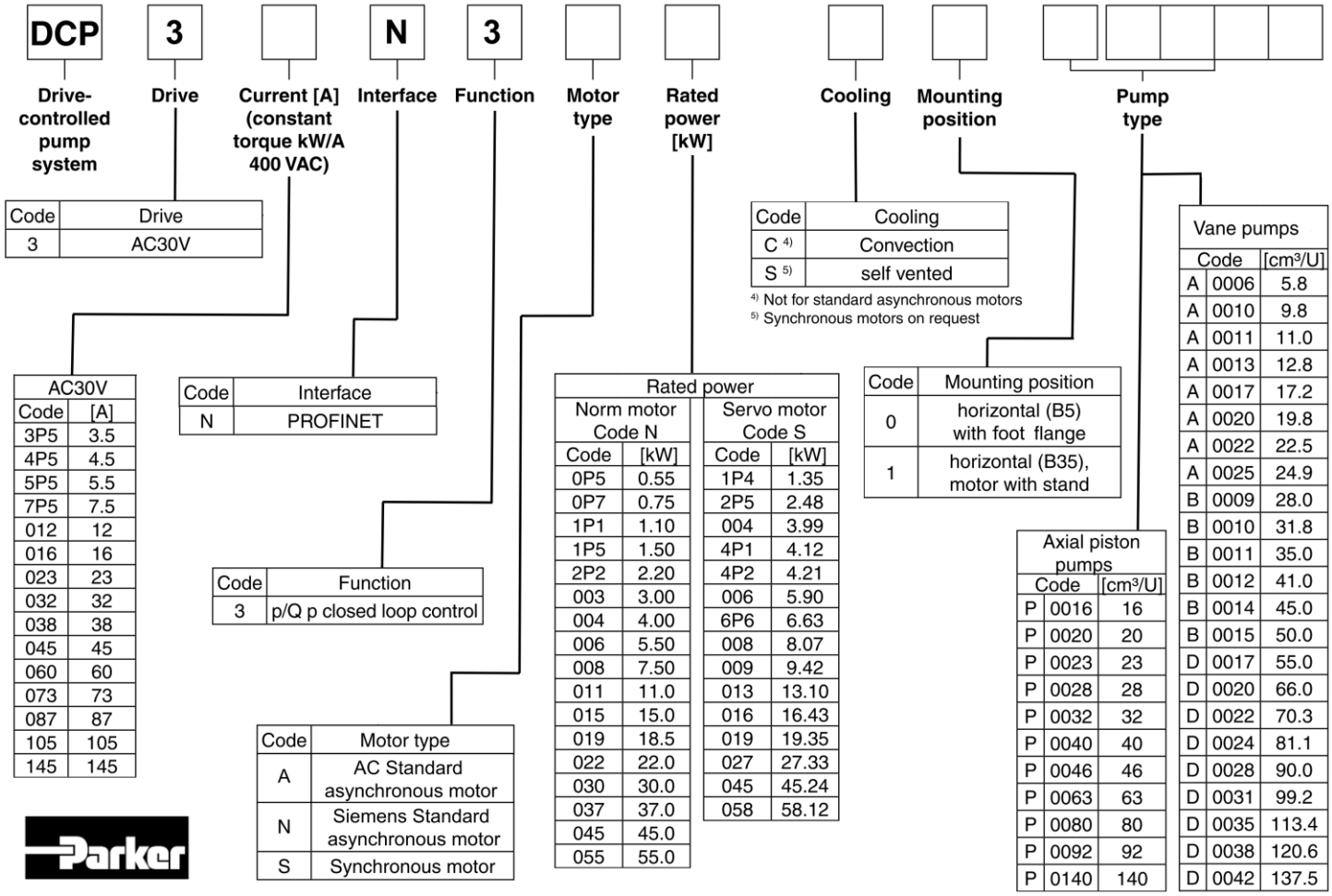
The pump can also be selected with variable displacement (with additional leakage drain port) according to requirements.

Drive Controlled PUMPS

Parker European Drive Controlled Pump website: www.parker.com/drivecontrolledpump

(Link to Data sheet)

DCP – for detailed systems design information see HY11-3352 UK / DE (not all combinations are possible)



Code	Drive
3	AC30V

Code	Cooling
C [4]	Convection
S [5]	self vented

[4] Not for standard asynchronous motors
[5] Synchronous motors on request

AC30V	
Code	[A]
3P5	3.5
4P5	4.5
5P5	5.5
7P5	7.5
012	12
016	16
023	23
032	32
038	38
045	45
060	60
073	73
087	87
105	105
145	145

Code	Interface
N	PROFINET

Code	Function
3	p/Q p closed loop control

Code	Motor type
A	AC Standard asynchronous motor
N	Siemens Standard asynchronous motor
S	Synchronous motor

Rated power			
Norm motor Code N		Servo motor Code S	
Code	[kW]	Code	[kW]
0P5	0.55	1P4	1.35
0P7	0.75	2P5	2.48
1P1	1.10	004	3.99
1P5	1.50	4P1	4.12
2P2	2.20	4P2	4.21
003	3.00	006	5.90
004	4.00	6P6	6.63
006	5.50	008	8.07
008	7.50	009	9.42
011	11.0	013	13.10
015	15.0	016	16.43
019	18.5	019	19.35
022	22.0	027	27.33
030	30.0	045	45.24
037	45.0	058	58.12
045	45.0		
055	55.0		

Code	Mounting position
0	horizontal (B5) with foot flange
1	horizontal (B35), motor with stand

Axial piston pumps		
Code		[cm³/U]
P	0016	16
P	0020	20
P	0023	23
P	0028	28
P	0032	32
P	0040	40
P	0046	46
P	0063	63
P	0080	80
P	0092	92
P	0140	140

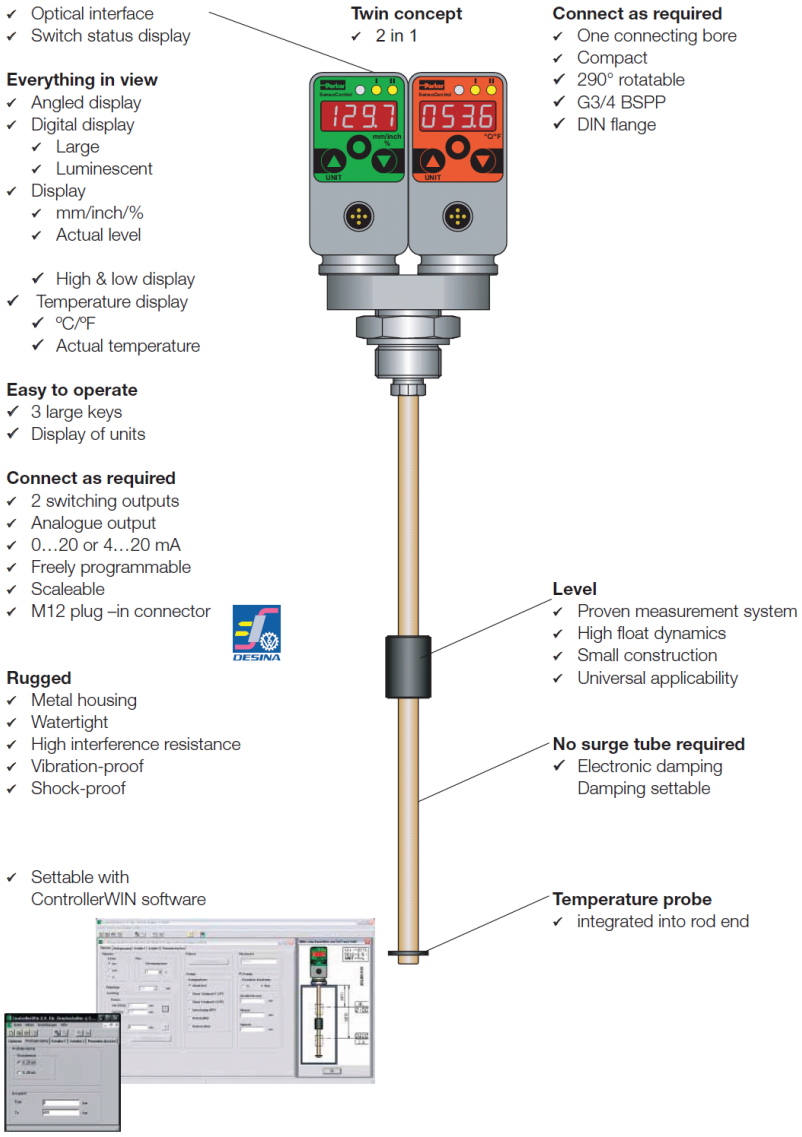
Vane pumps		
Code		[cm³/U]
A	0006	5.8
A	0010	9.8
A	0011	11.0
A	0013	12.8
A	0017	17.2
A	0020	19.8
A	0022	22.5
A	0025	24.9
B	0009	28.0
B	0010	31.8
B	0011	35.0
B	0012	41.0
B	0014	45.0
B	0015	50.0
D	0017	55.0
D	0020	66.0
D	0022	70.3
D	0024	81.1
D	0028	90.0
D	0031	99.2
D	0035	113.4
D	0038	120.6
D	0042	137.5

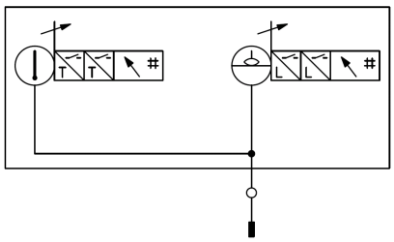
Axial piston pumps: PV Series, Vane pumps: T7 Series

The model code may be followed by “XG_ _ _” to define modifications for special requirements exceeding standards.

Type must be selected according to required power & load cycle and to be agreed with Parker HCDE & OPEL during SE-Meeting. A calculation tool to select the required components is online available:
www.parker.com/drivecontrolledpump

3.1.2 Level / Temperature Control



Symbol	Description	Model Number
	**Level** 2 switching outputs; without analogue output M12x1; plug-in connector; 4-pole	**SCLTSD- xxx*-00-07** xxx* built-in length (L1) 250/370/520 mm **(Link to Data sheet)**
	Temperature 2 switching outputs; without analogue output M12x1; plug-in connector; 4-pole	

3.1.3 Compact Power Units

For special applications, e.g. for secondary functions such as clamping, a 40L vertical power unit is available. The use of the 40L compact power unit requires the approval of OPEL. Please consult with Parker Hannifin for design assistance. This unit can be supplied with a fixed displacement gear pump to charge a small accumulator, which is then unloaded. This power unit is equipped with both dual level and dual temperature switches. The system directional valves must be mounted by the OEM to the machine and not located on the power unit.

Conditions:

- Max operating pressure — p < 120bar (Higher pressure for clamping applications only, if approved by controls engineer)
- Rotational speed: — n = 1000-1500 U/min (50 Hz)
- **Operating time:** — **S1 ED 100%**
  An electronic monitoring of the oil temperature should be carried out as per SP-F-Hyd.
- **SE** — **ED 20%, 10min.**
  There should be provision for an optical temperature display.
  The oil temperature should not exceed the specification values as per SP-F-Hyd.

The Compact Power Units are available according to:

Basic power unit:

- with external gear pump type PGP
- with Motor Pump Unit
- with aluminum reservoir usable content of 40L
- required sensor technology

Control variants:

- Pressure relief unit
- Pressure relief unit with series plate NG6
- Multi station manifold with accumulator charging unit
- With diaphragm accumulator

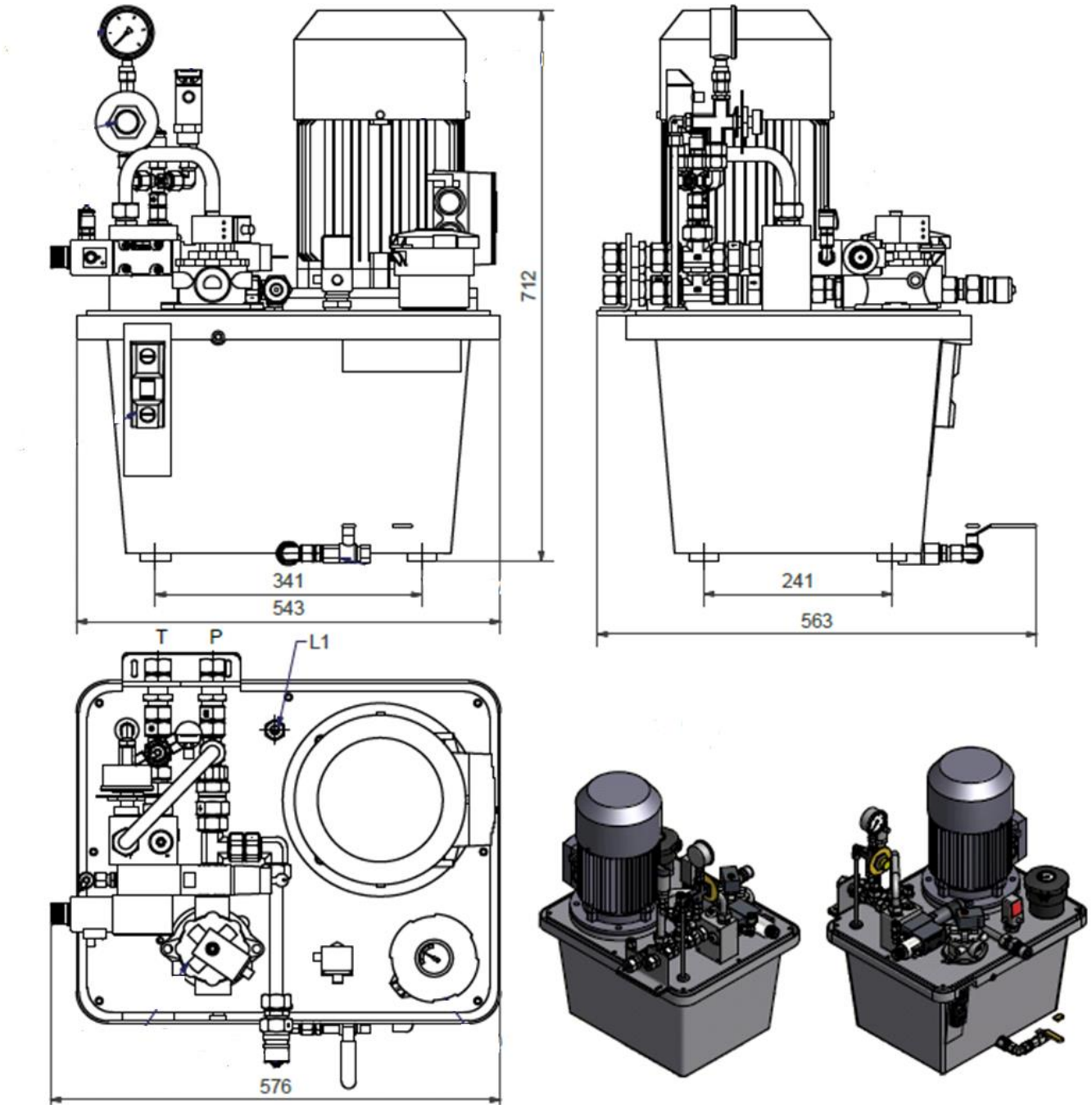
Pump			**E-motor**, n=1000-1500min^{-1}, 50Hz		Order No.
Type	$Q_{v\,max}$ [L/min]	p_{max} * [bar]	Power [KW]	Component size	
PGP511A0060CS4D3NE5B1*B1E3	6,0	75	0.75	90S	3349116620
		110	1.1	90L	3349116620
		150	1.5	100L	3349116620
PGP511A0080CS4D3NE5B1*B1E3	8,0	82	1.1	90L	3349116386
		112	1.5	100L	3349116386
		165	2.2	112M	3349116386
PGP511A0110CS4D3NE5B1*B1E3	11,0	82	1.5	100L	3349116619
		120	2.2	112M	3349116619

* p_{max} at 235 bar; Theoretical without consideration of total efficiency factor. (hydraulic / mechanic).

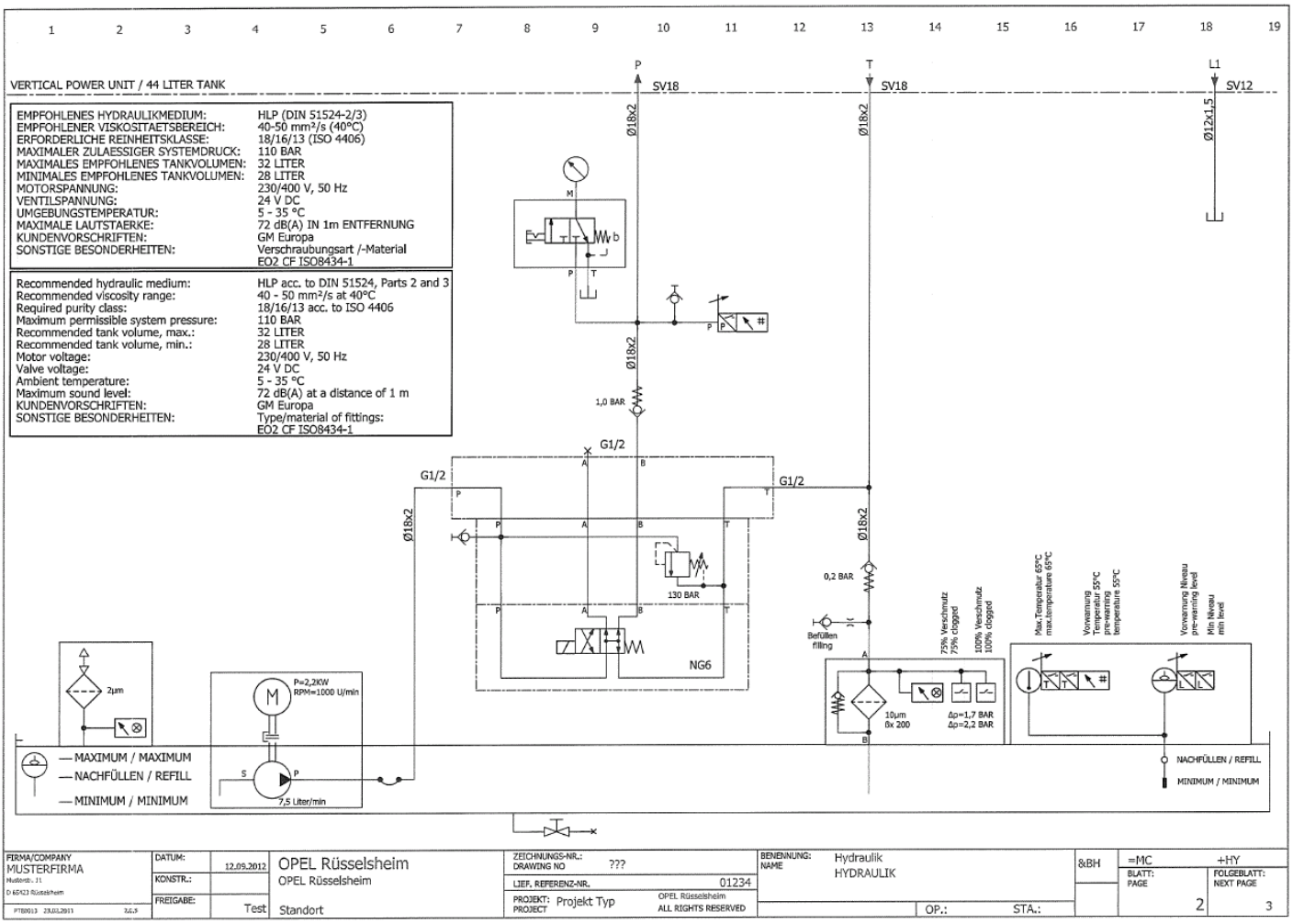
Compact power unit 40L with motor-pump assembly in vertical design

The specified dimensions are approximate dimensions. You will receive the exact dimensions in case of order.

Please take into consideration a removal space for the components assembled on the unit.

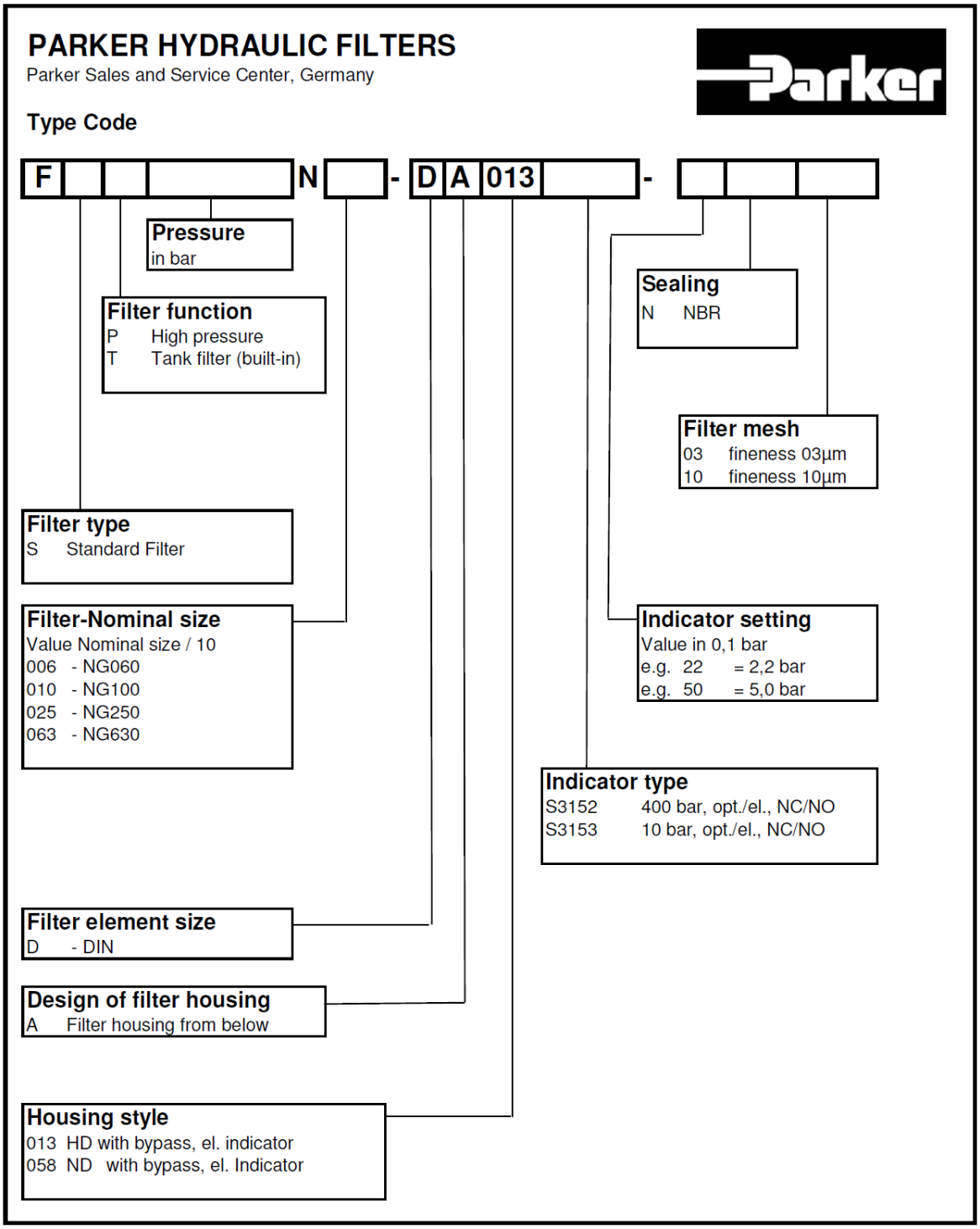


Note: All dimensions are approximate dimensions!


VERTICAL POWER UNIT / 44 LITER TANK
EMPFOHLENES HYDRAULIKMEDIUM: HLP (DIN 51524-2/3)
EMPFOHLENER VISKOSITAETSBEREICH: 40-50 mm²/s (40°C)
ERFORDERLICHE REINHEITSKLASSE: 18/16/13 (ISO 4406)
MAXIMALER ZULAESSIGER SYSTEMDRUCK: 110 BAR
MAXIMALES EMPFOHLENES TANKVOLUMEN: 32 LITER
MINIMALES EMPFOHLENES TANKVOLUMEN: 28 LITER
MOTORSPANNUNG: 230/400 V, 50 Hz
VENTILSPANNUNG: 24 V DC
UMGEBUNGSTEMPERATUR: 5 - 35 °C
MAXIMALE LAUTSTAERKE: 72 dB(A) IN 1m ENTFERNUNG
KUNDENVORSCHRIFTEN: GM Europa
SONSTIGE BESONDERHEITEN: Verschraubungsart /-Material EO2 CF ISO8434-1
Recommended hydraulic medium: HLP acc. to DIN 51524, Parts 2 and 3
Recommended viscosity range: 40 - 50 mm²/s at 40°C
Required purity class: 18/16/13 acc. to ISO 4406
Maximum permissible system pressure: 110 BAR
Recommended tank volume, max.: 32 LITER
Recommended tank volume, min.: 28 LITER
Motor voltage: 230/400 V, 50 Hz
Valve voltage: 24 V DC
Ambient temperature: 5 - 35 °C
Maximum sound level: 72 dB(A) at a distance of 1 m
KUNDENVORSCHRIFTEN: GM Europa
SONSTIGE BESONDERHEITEN: Type/material of fittings: EO2 CF ISO8434-1
P
T
L1
SV18
SV18
SV12
Ø18x2
Ø18x2
Ø12x1,5
1,0 BAR
G1/2
G1/2
G1/2
130 BAR
0,2 BAR
NG6
Befüllen
filling
2µm
P=2,2KW
RPM=1000 U/min
7,5 Liter/min
10µm
0x 200
Δp=1,7 BAR
Δp=2,2 BAR
75% Verschmutz
75% clogged
100% Verschmutz
100% clogged
Max.Temperatur 65°C
max.temperature 65°C
Vorwarnung Temperatur 55°C
pre-warning temperature 55°C
Vorwarnung Niveau
pre-warning level
Min Niveau
min level
— MAXIMUM / MAXIMUM
— NACHFÜLLEN / REFILL
— MINIMUM / MINIMUM
NACHFÜLLEN / REFILL
MINIMUM / MINIMUM
FIRMA/COMPANY
MUSTERFIRMA
DATUM: 12.09.2012
KONSTR.:
FREIGABE: Test
OPEL Rüsselsheim
OPEL Rüsselsheim
Standort
ZEICHNUNGS-NR.: ???
DRAWING NO
LIEF. REFERENZ-NR. 01234
PROJEKT: Projekt Typ
PROJECT
OPEL Rüsselsheim
ALL RIGHTS RESERVED
BENENNUNG: Hydraulik
NAME HYDRAULIK
OP.:
STA.:
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=MC +HY
BLATT: PAGE 2
FOLGEBLATT: NEXT PAGE 3

3.1.4 Filters (to DIN 24550)

Parker European Filter website: www.parkerhfde.com



3.1.5 Pressure Filters (to DIN 24550)

Filter Rating (µm)	Max. capacity of flow (l/min)	Parker Model Number	Filter replacement element number	
3	20	FSP400N006DA013S315250N03	FDAE2A02Q	**Data sheet on request**
10	30	FSP400N006DA013S315250N10	FDAE2A10Q	
Sealing Kit		FDS-001		
3	30	FSP400N010DA013S315250N03	FDAE3A02Q	
10	70	FSP400N010DA013S315250N10	FDAE3A10Q	
Sealing Kit		FDS-001		
3	130	FSP400N025DA013S315250N03	FDBE2A02Q	
10	190	FSP400N025DA013S315250N10	FDBE2A10Q	
Sealing Kit		FDS-003		

3.1.6 Return filters (to DIN 24550)

Filter Rating (µm)	Max. capacity of flow (l/min)	Parker Model Number	Filter replacement element number	
3	30	FST10N010DA058S315322N03	10DTEA03	**Data sheet on request**
10	70	FST10N010DA058S315322N10	10DTEA10Q	
Sealing Kit		10DTA #DTS-001		
3	130	FST10N025DA058S315322N03	25DTEA03	
10	200	FST10N025DA058S315322N10	25DTEA10Q	
Sealing Kit		25DTA #DTS-002		
3	180	FST10N063DA058S315322N03	G04711	
10	300	FST10N063DA058S315322N10	G04713	
Sealing Kit		40RF #S02658		

3.1.7 Filter electrical indicators

Per G2.0 Global Hydraulic Specifications: All filtration shall have a separate electronic pressure switch with 2 operating points.
1st. Switch Point: Filter 75% Clogged Warning, 2nd Switch Point: Filter 100% Clogged Machine End of Cycle Stop.

All listed filters are completed with electrical/optical indicators. M12x1; 10-30V

Filter Type			Indicator Model Number
Return Filters	FST10N010D	LED – clogging indicator (electrical/optic; pressure head 1.7 / 2.2bar)	S3153
	FST10N025D		
	FST10N063D		
Pressure Filters	FSP400N006D	LED – clogging indicator (electrical/optic; differential pressure 3.7 / 5bar)	S3152
	FSP400N010D		
	FSP400N025D		

Alternative optic or electrical clogging indicator available by request.

3.2 PUMPS

Parker European Pump and Motor webside: www.parker.com/PMDE

3.2.1 Main Pump, variable displacement

Displacement V (ccm)	Operation Pressure P (bar)	Model Number & Description	
16	max. 140	PVS16EH140	(Link to Data sheet)
25		PVS25EH140	
32		PVS32EH140	
40		PVS40EH140	
80		1x PVS50EH140 + 1x PVS32AZ140 (als Ersatzteil Einzelpumpe, nicht montiert)	

Displacement V (ccm)	Operation Pressure P (bar)	Model Number & Description	
20	max. 350	PV020R1K1T1NMMC	(Link to Data sheet)
32		PV032R1K1T1NMMC	
40		PV040R1K1T1NMMC	
80		PV080R1K1T1NMMC	

Note: PD series piston pump is approved for all sizes except for the 18cc displacement (Link to Data sheet)

3.2.2 Main Pump, constant displacement

Displacement V (ccm)	Operation Pressure P (bar)	Model Number & Description	
17	max. 275	T7A B17 2R00 A104	(Link to Data sheet)
25		T7B B08 2R00 A1M1	(Link to Data sheet)
31		T7B B10 2R00 A1M1	
41		T7B B12 2R00 A1M1	
55	max. 250	T7D B17 5R00 A1MO	
81		T7D B24 5R00 A1MO	

3.2.3 Offline Filtration Pump

Displacement V (ccm)	Operation Pressure P (bar)	Model Number & Description	
17	max. 25	T6CMYR051R00C1	(Link to Data sheet)
21		T6CMYR061R00C1	
26		T6CMYR081R00C1	
34		T6CMYR101R00C1	
37		T6CMYR121R00C1	
46		T6CMYR141R00C1	
58		T6CMYR171R00C1	

Offline Filtration Pump, QPM series, constant, motor pump unit

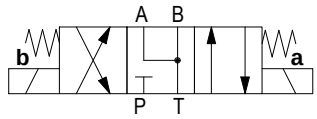
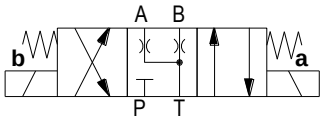
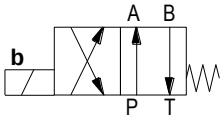
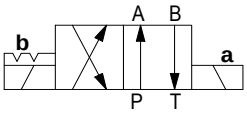
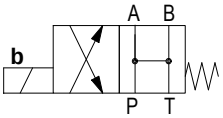
Displacement V (ccm)	Operation Pressure P (bar)	Model Number & Description	
20	max. 10	QPM3-20-4-0,75-BI10	(Link to Data sheet)
40		QPM3-40-4-0,75-BI10	
60		QPM-3-60-4-1,50-BI10	
80	max. 5	QPM-3-60-4-1,50-BI5	

3.3 DIRECTIONAL VALVES

Parker European Hydraulic Valve website: www.parker.com/EURO_HCD

3.3.1 NG 6 (D03) Four-Way Directional Control Valves

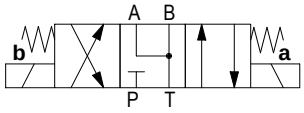
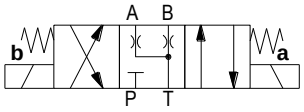
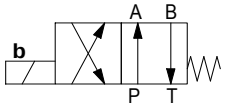
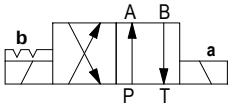
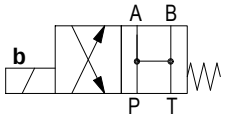
Subplate mounted, 24VDC, **P=31Watts**, NBR seals, **M12x1 connector on each solenoid**;
Pin configuration: pin 4= 24VDC, pin 3= 0V, pins 2 & 1 bridged.

Symbol	Model Number & Description	
	**D1VW004CNJDJ5** Double Solenoid, 3-Position A & B to Tank, Pressure Blocked	**(Link to Data sheet)**
	**D1VW011CNJDJ5** Double Solenoid, 3-Position A & B Bleed to Tank, Pressure Blocked	
	**D1VW020BNJDJ5** Single Solenoid, 2-Position, Spring Return	
	**D1VW020DNJDJ5** Double Solenoid, 2-Position, Detent Note: To be used for clamping applications only. Other applications require written approval from OPEL.	
	**D1VW002ENJDJ5** Single Solenoid, 2-Position, Spring Return	

NG6 (D03) **Soft Shifting, Four-Way Directional Control Valves**

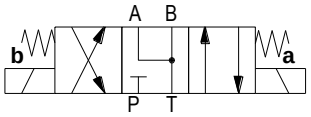
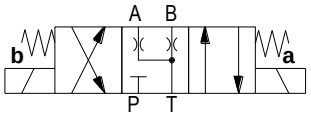
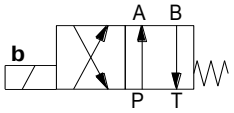
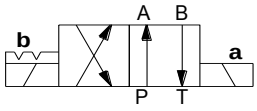
Subplate mounted, 24VDC, **P=31Watts**, NBR seals, 0.020" orifice, **M12x1 connector on each solenoid**; Pin configuration: pin 4= 24V, pin 3= 0V, pins 2 & 1 bridged.

Soft shift valves should be used for those applications where smooth shifting valves are required to reduce hydraulic shock.

Symbol	Model Number & Description	
	**D1VW004CNJDJS25** Double Solenoid, 3-Position, A & B Bleed to Tank, Pressure Blocked	(Link to Data sheet)
	**D1VW082CNJDJS25** Double Solenoid, 3-Position, A & B Bleed to Tank, Pressure Blocked	
	**D1VW101BNJDJS25** Single Solenoid, 2-Position, Spring Return	
	**D1VW101DNJDJS25** Double Solenoid, 2-Position, Detent Note: To be used for clamping applications only. Other applications require written approval from OPEL.	
	**D1VW102ENJDS2J5** Single Solenoid, 2-Position, Spring Return	

3.3.2 NG10 (DO5) Four-Way Directional Control Valves

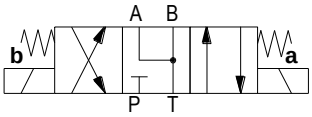
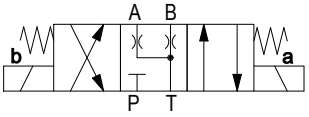
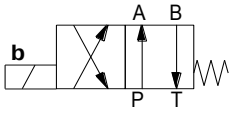
Subplate mounted, 24 VDC, **P= 36 Watts**, Nitrile seals, **M12x1 connector on each solenoid** by adapter from DIN to M12x1 with LED and integrated protection circuits;
Pin configuration: pin 4= 24V, pin 3= 0V, pins 2 & 1 bridged.

Symbol	Model Number & Description	
	**D3W004CNJDJ5** Double Solenoid, 3-Position, A&B to Tank, Pressure Blocked,	(Link to Data sheet)
	**D3W011CNJDJ5** Double solenoid, 3-Position, A&B Bleed to Tank, Pressure Blocked	
	**D3W020BNJDJ5** Single Solenoid, 2-Position, Spring Return	
	**D3W020CNJDJ5** Double Solenoid, 2-Position, Detent Note: To be used for clamping applications only. Other applications require written approval from OPEL.	

NG10 (D05) **Soft Shifting, Four-Way Directional Control Valves**

Subplate mounted, 24 VDC, **P= 36 Watts**, NBR seals, **M12x1 connector on each solenoid** by adapter from DIN to M12x1 with LED and integrated protection circuits;
Pin configuration: pin 4= 24V, pin 3= 0V, Pins 2 & 1 bridged;

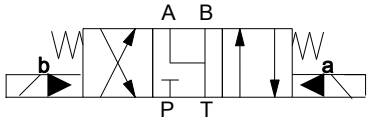
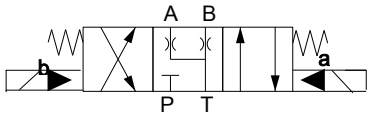
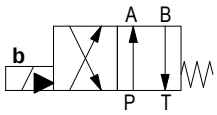
Soft shift valves should be used for those applications where smooth shifting valves are required to reduce hydraulic shock.

Symbol	Model Number & Description	
	**D3W004CNJWS4** Double Solenoid, 3-Position, A&B to Tank, Pressure Blocked	(Link to Data sheet)
	**D3W011CNJWS4** Double Solenoid, 3-Position, A&B Bleed to Tank, Pressure Blocked	
	**D3W020BNJWS4** Single Solenoid, 2-Position Spring Return	

3.3.3 NG16 (D07) Four-Way Directional Control Valves

Subplate mounted, 24 VDC, **P= 31 Watts**, NBR seals, **M12x1 connector on each solenoid**;
Pin configuration: pin 4= 24V, pin 3= 0V, pins 2 & 1 bridged;

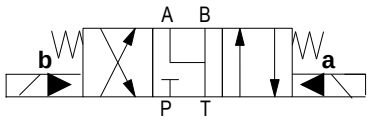
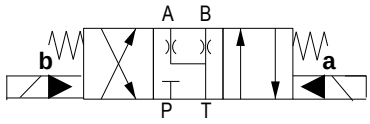
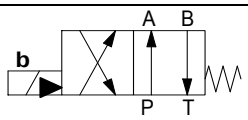
Internally piloted and internally drained.

Symbol	Model Number & Description	
	**D41VW004C4NJDJ5** Double Solenoid, 3-Position, A&B to Tank, Pressure Blocked	(Link to Data sheet)
	**D41VW011C4NJDJ5** Double Solenoid, 3-Position, A&B Bleed to Tank, Pressure Blocked	
	**D41VW020B4NJDJ5** Single Solenoid, 2-Position Spring Return	

3.3.4 NG25 (D08) Four-Way Directional Control Valves

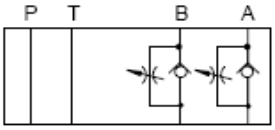
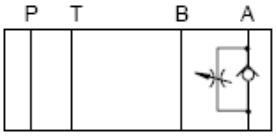
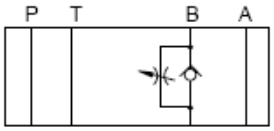
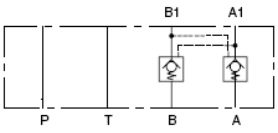
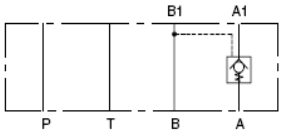
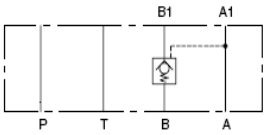
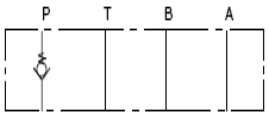
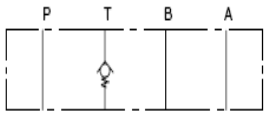
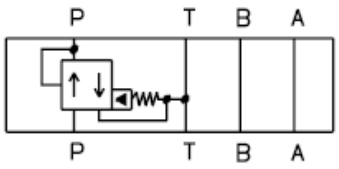
Subplate mounted, 24 VDC, **P= 30 Watts**, NBR seals, **M12x1 connector on each solenoid**;
Pin configuration: pin 4 =24V, pin 3=0V, pins 2 & 1 bridged;

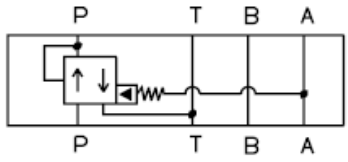
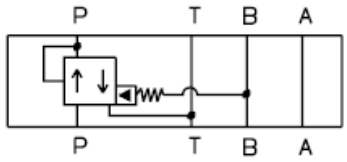
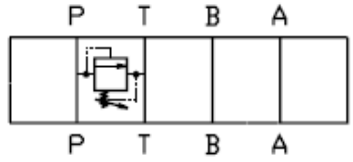
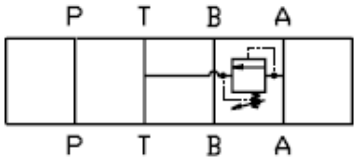
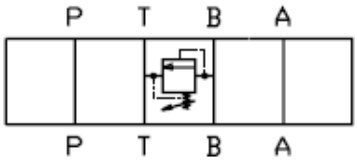
Internally piloted and internally drained.

	**D81VW004C4NJDJ5** Double Solenoid, 3-Position A&B to Tank, Pressure Blocked	(Link to Data sheet)
	**D81VW011C4NJDJ5** Double Solenoid, 3-Position A&B Bleed to Tank, Pressure Blocked	
	**D81VW020B4NJDJ5** Single Solenoid, 2-Position Spring Return	

3.4 MODULAR SANDWICH VALVES

3.4.1 NG6 (DO3) Sandwich Modules

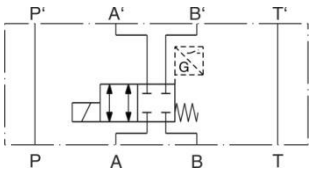
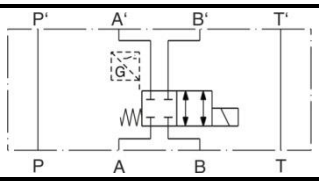
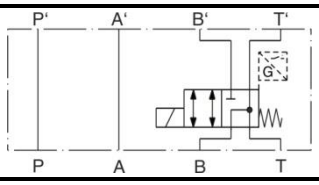
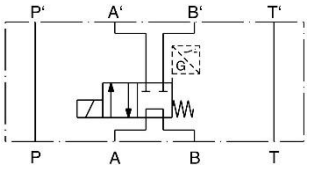
Symbol	Model Number & Description	
	**Dual Flow Control Module** A & B Ports Dual Function (Reversible) for Meter In Or Meter Out Applications **FM2DDSV**	(Link to **Data Sheet**)
	**A Port Flow Control Module** Meter In Throttling: **ZRD-AZ01-S0-D5** Or Meter Out Throttling: **ZRD-AA01-S0-D5**	(Link to **Data Sheet**)
	**B Port Flow Control Module** Meter Out Throttling: **ZRD-BA01-S0-D5**	
	**Double Pilot Check Module** A&B Port, Pilot Ratio 3:1 Opening Pressure 10 bar **CPOM2DDV**	(Link to **Data Sheet**)
	**A Port Pilot Check Module** Pilot Ratio 3:1 Opening Pressure 10 bar **CPOM2AAV**	
	**B Port Pilot Check Module** Pilot Ratio 3:1 Opening Pressure 10 bar **CPOM2BBV**	
	**P Port Check Module** Opening Pressure 0,3 bar **CM2PPV**	(Link to **Data Sheet**)
	**T Port Check Module** Opening Pressure 0,3 bar **CM2TTV**	
	**P Port Reducing Module** P Port Sensing	
	PRDM2PP02SVG - 25 bar	(Link to **Data Sheet**)
	PRDM2PP06SVG - 64 bar	
	PRDM2PP16SVG - 160 bar	

	**P Port Reducing Module** A Port Sensing	
	PRDM2AA02SVG - 25 bar	**(Link to Data Sheet)**
	PRDM2AA06SVG - 64 bar	
	PRDM2AA16SVG - 160 bar	
	**P Port Reducing Module** B Port Sensing	
	PRDM2BB02SVG - 25 bar	**(Link to Data Sheet)**
	PRDM2BB06SVG - 64 bar	
	PRDM2BB16SVG - 160 bar	
	**P to T Pressure Relief Module**	
	ZDV-P01-1-S0-C5 - 70 bar	**(Link to Data Sheet)**
	ZDV-P01-5-S0- C5- 350 bar	
	**A to T Pressure Relief Module**	
	ZDV-A01-1-S0- C5- 70 bar	**(Link to Data Sheet)**
	ZDV-A01-5-S0- C5- 350 bar	
	**B to T Pressure Relief Module**	
	ZDV-B01-1-S0- C5- 70 Bar (1015 PSI)	**(Link to Data Sheet)**
	ZDV-B01-5-S0- C5- 350 Bar (5075 PSI)	

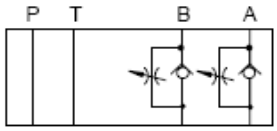
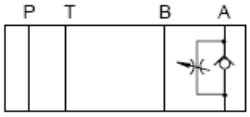
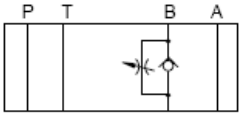
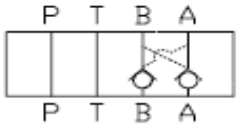
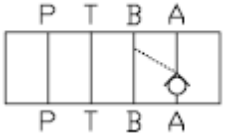
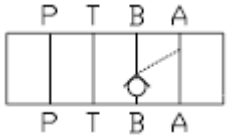
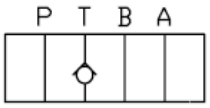
Note: All NG6 Modules are 40MM high

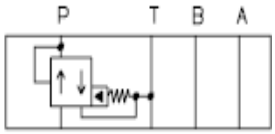
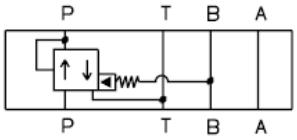
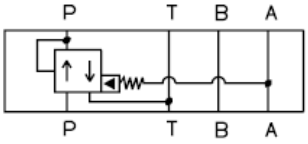
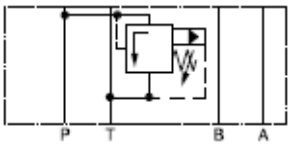
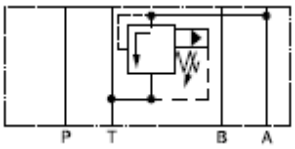
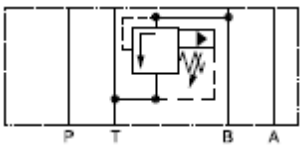
NG06 (D03) **Shut-off valve**

Sandwich mounted, 24VDC, **P=31Watts**, NBR seals, 0.020" orifice, **M12x1 connector on each solenoid**; Pin configuration: pin 4= 24V, pin 3= 0V, pins 2 & 1 bridged.

Symbol	Model Number & Description	
	**Z1DWA02ENJDJ5**	**(Link to Data Sheet)**
	**Z1DWA01KNJDJ5**	
	**Z1DWB37BNJDJ5**	
	**Z1DWA04KNJDJ5**	

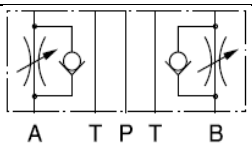
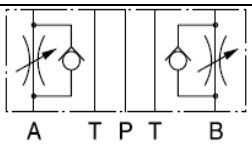
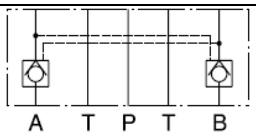
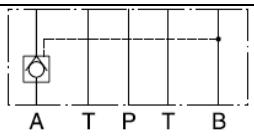
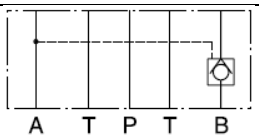
3.4.2 NG10 (D05) Sandwich Valves

Symbol	Model Number & Description	
	**Dual Flow Control Module** Meter in or meter out throttling **FM3DDSV**	(Link to Data Sheet)
	**A Port Flow Control Module** Meter in or meter out throttling **FM3AASV**	
	**B Port Flow Control Module** Meter in or meter out throttling **FM3BBSV**	
	**Dual P.O. Check Module** Opening pressure: 0.8 bar **CPOM3DDV**	(Link to Data Sheet)
	**A Port P.O. Check Module** Opening pressure: 0.8 bar **CPOM3AAV**	
	**B Port P.O. Check Module** Opening pressure: 0.8 bar **CPOM3BBV**	
	**P Port Check Module** **CM3PPV**	(Link to Data Sheet)
	**T Port Check Module** **CM3TTV**	

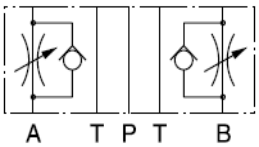
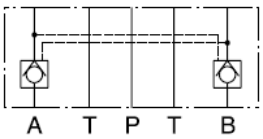
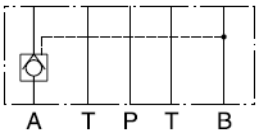
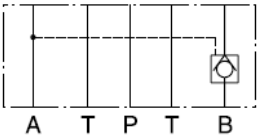
	**P Port Pressure Reducing Module**	
	PRDM3PP01SVG – 19 bar	(Link to **Data Sheet**)
	PRDM3PP05SVG - 50 bar	
	PRDM3PP15SVG - 150 bar	
	**P Port Pressure Reducing Module** B Port Sensing	
	PRDM3BB01SVG – 19 bar	(Link to **Data Sheet**)
	PRDM3BB05SVG – 50 bar	
	PRDM3BB15SVG – 150 bar	
	**P Port Pressure Reducing Module** A Port Sensing	
	PRDM3AA01SVG - 19 bar	(Link to **Data Sheet**)
	PRDM3AA05SVG - 50 bar	
	PRDM3AA15SVG - 150 bar	
	**P to T Pressure Relief Module**	
	ZDV-P02-1-S0-D5 - 70 bar	(Link to **Data Sheet**)
	ZDV-P02-5-S0-D5 - 350 bar	
	**A to T Pressure Relief Module**	
	ZDV-A02-1-S0-D5 - 70 bar	(Link to **Data Sheet**)
	ZDV-A02-5-S0-D5 - 350 bar	
	**B to T Pressure Relief Module**	
	ZDV-B02-1-S0-D5 - 70 bar	(Link to **Data Sheet**)
	ZDV-B02-5-S0-D5 - 350 bar	

Note: Not all NG10 (D05) sandwich modules are 50 mm high. This needs to be confirmed so the correct size bolt kit can be ordered.

3.4.3 NG16 (D07) Sandwich Modules

Symbol	Model Number & Description	
	**ZRD-ABZ03-S0-C5** Meter-in flow control in A and B	(Link to Data Sheet)
	**ZRD-ABA03-S0-C5** Meter-out flow control in A and B	
	**ZRE-AB03-C5** Dual P.O. Check Module	
	**ZRE-A03-C5** A port P.O. Check Module	(Link to Data Sheet)
	**ZRE-B03-C5** B Port P.O. Check Module	

3.4.4 NG25 (D08) Sandwich Modules

Symbol	Model Number & Description	
	**FM6DDKV** Meter Out Flow Control in A & B	(Link to Data Sheet)
	**CPOM6DDV** Dual P.O. Check Module	
	**CPOM6AAV** A Port P.O. Check Module	(Link to Data Sheet)
	**CPOM6BBV** B Port P.O. Check Module	

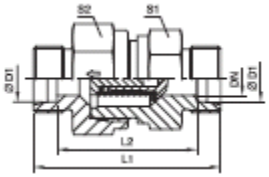
3.5 INLINE CHECK VALVES

Parker Fluid Connectors website: www.parker.com/FCGE

ISO 8434-1, 24° Metric Flareless Bite Type, Connections: EO Nuts / EO Nuts.
Other connections are available on request. (Catalog Parker Hannifin: cat/4401-8)

Cracking pressure: 1,0 bar / standard; other cracking pressure sizes are available on request.





(Link to **Data Sheet**)

Size		D1	DN	Model Number	PN [bar]
Low	Heavy				
L		06	3,5	**RHD06LOMDCF**	400
	S			**RHD06SOMDCF**	420
L		08	5,5	**RHD08LOMDCF**	400
	S		3,5	**RHD08SOMDCF**	420
L		10	7,5	**RHD10LOMDCF**	400
	S		5,5	**RHD10SOMDCF**	420
L		12	9,5	**RHD12LOMDCF**	400
	S		7,5	**RHD12SOMDCF**	420
L		15	11,0	**RHD15LOMDCF**	400
	S	14	9,5	**RHD14SOMDCF**	420
L		18	14,0	**RHD18LOMDCF**	400
	S	16	11,0	**RHD16SOMDCF**	420
L		22	18,0	**RHD22LOMDCF**	250
	S	20	15,0	**RHD20SOMDCF**	420
L		28	23,0	**RHD28LOMDCF**	250
	S	25	19,0	**RHD25SOMDCF**	420
L		35	29,0	**RHD35LOMDCF**	250
	S	30	24,0	**RHD30SOMDCF**	250
L		42	29,0	**RHD42LOMDCF**	250
	S	38	29,0	**RHD38SOMDCF**	250

3.6 PROPORTIONAL VALVES

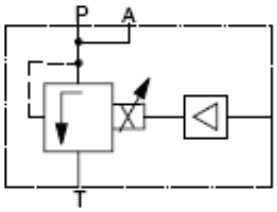
For all valve control units corresponding software is available as FREE WARE. Please look at Parker Website: **www.parker.com/Euro HCD**, follow “Support”.

Parameterizing cable useable for all proportional valves is available by Order-# 40982923.

3.6.1 Proportional Pressure Control NG06 / NG10

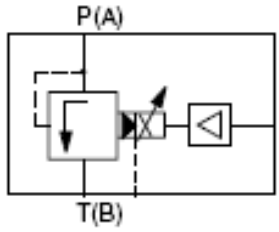
NG06 (D03)

Direct Operated Pressure Relief, Subplate Mounted, Max Flow **40 LPM**, with on-board electronics

Size	Description	Model Number	
	Adj. to 105 bar	**RE06M10T2N1F0**	(Link to Data Sheet)
	Adj. to 175 bar	**RE06M17T2N1F0**	
	Adj. to 250 bar	**RE06M25T2N1F0**	
	Electrical Connector	**5004072**	

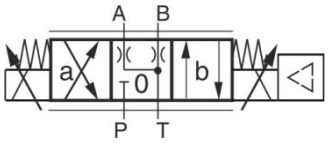
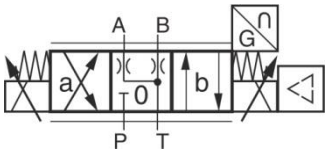
NG10 (D05)

Pilot Operated Pressure Relief, Subplate Mounted, Max Flow **250 LPM**, with on-board electronics

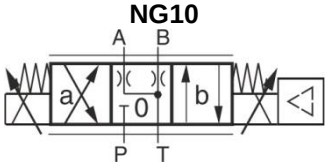
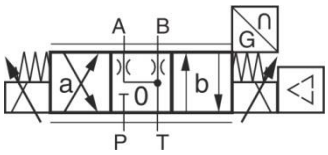
Size	Description	Model Number	
	Adj. to 105 bar	**R6V03-591P2N10VB1**	(Link to Data Sheet)
	Adj. to 175 bar	**R6V03-593P2N10VB1P17**	
	Adj. to 250 bar	**R6V03-595P2N10VB1P25**	
	Electrical Connector	**5004072**	

3.6.2 Proportional Directional Valves

Direct Operated with Integrated Electronics, +10 or –10 Volts DC

Size	Description	Model Number	
	12 L/min.	**D1FBE02FC0NF03**	(Link to Data Sheet)
	20 L/min.	**D1FBE02HC0NF03**	
	30 L/min.	**D1FBE02KC0NF03**	
NG6 	12 L/min.	**D1FCE02FC9NB03**	(Link to Data Sheet)
	20 L/min.	**D1FCE02HC9NB03**	
	30 L/min.	**D1FCE02KC9NB03**	
	Electrical Connector	**5004072**	

NG10 Direct Operated with Integrated Electronics , +10 or –10 Volts DC

Size	Description	Model Number	
NG10 	40 L/min.	**D3FBE02MC0NF03**	(Link to Data Sheet)
	60 L/min.	**D3FBE02SC0NF03**	
	80 L/min.	**D3FBE02UC0NF03**	
NG10 	40 L/min.	**D3FCE02MC9NB03**	(Link to Data Sheet)
	60 L/min.	**D3FCE02SC9NB03**	
	80 L/min.	**D3FCE02UC9NB03**	
	Electrical Connector	**5004072**	

3.7 Throttle Check Valves

Manatrol throttle check valve with fine adjustment of flow rate. A 2-stage needle provides very exact setting of smaller flow rates. NBR sealing.
Return check poppet: Nominal cracking pressure: 0.4bar
Operating temperature: -40°C to 121°C

Connection Size	**Q** [l/min; Δp: 10bar]	**Model Number**	
G1/8	11	9F200S	**(Link to Data Sheet)**
G1/4	25	9F400S	
G3/8	40	9F600S	
G1/2	50	9F800S	
G3/4	120	9F1200S	
G1	250	9F1600S	

3.8 Accumulator Charging Valves

NG 6 (D03) **Manuel Controlled Valves**

Pilot operate plate valve; operating pressure max. 315 bar; max. flow rate: 30 l/min;

Description	**Pressure stage** [bar]	**Model Number**	
Accumulator charging valve	20-45	VAY045A06AA1	**(Link to Data Sheet)**
	45-80	VAY080A06AA1	
	80-120	VAY120A06AA1	
	120-175	VAY175A06AA1	
	175-250	VAY250A06AA1	
	250-315	VAY350A06AA1	

NG 10 (D05) **Manuel Controlled Valves**

Pilot operate plate valve; operating pressure max. 250 bar; max. flow rate: 90 l/min;

Description	**Pressure stage** [bar]	**Model Number**	
Accumulator charging valve	45-80	VAY080A10AA1	**(Link to Data Sheet)**
	80-120	VAY120A10AA1	
	120-175	VAY175A10AA1	
	175-250	VAY250A10AA1	

3.9 ACCUMULATORS *1 – 37 Liters (¼– 10 Gallons)*

Parker Gobal Accumulators website**:** **www.parker.com/ACDE**

Accumulators according to DIN EN 14359

Diaphragm – Type (Link to **Data Sheet**)

Volume (Liters)	**Pressure Rating** (bar)	**Ports** (ISO 1179-1)	**Model Number**
1.0 L	210	G 1/2	**10984701125** **(ELM1-210/85/AF)**

Bottom Repairable Bladder Accumulators (Link to **Data Sheet**)

Volume (Liters)	**Pressure Rating (bar)**	**Thread**	**Model Number**
1 L	350	G ¾	**10866901125** **(EHV ACCU 1-350/90)**
4 L	350	G 1¼	**10866101125** **(EHV ACCU 4-350/90)**
10 L	330	G 2	**10865401125** **(EHV ACCU 10-330/90)**
20 L	330	G 2	**10865501125** **(EHV ACCU 20-330/90)**
32 L	330	G 2	**10865701125** **(EHV ACCU 32-330/90)**

Accessories (Link to **Data Sheet**)

Accessory	**Volume**	**Model Number**
Clamp Brackets	1 Liter	**20251003648 (E114)**
Clamp Brackets	4 Liter	**20251303648 (E168)**
Clamp Brackets	10 – 50 Liter	**20251503648 (D226)**
Base Bracket Assembly	4 Liter	**2018703620 (CE108)**
Base Bracket Assembly	10 – 50 Liter	**20109003620 (CE159A)**
Charging & Gauging Assembly Kit	All Bladder & Piston Sizes	**20214139833** **(VGU/F.25/400.8.TS3.3)**

Adapter für Charging & Gauging Assembly Kit

VGU Connections

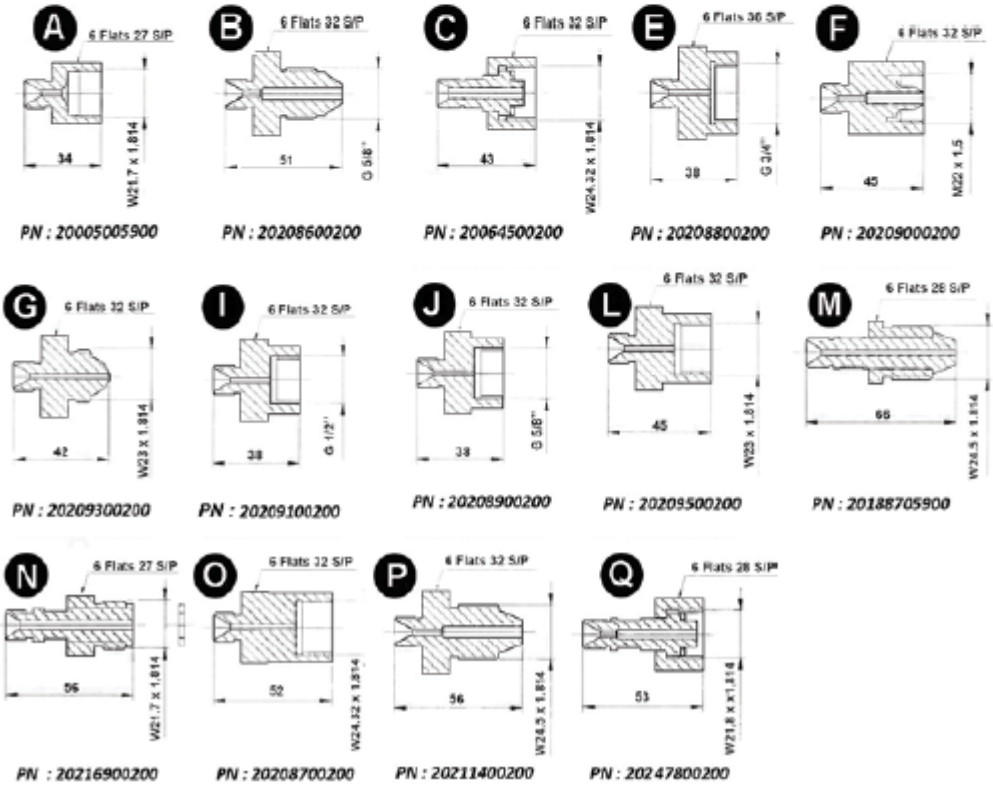
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ARGENTINA	B
AUSTRALIA	B
AUSTRIA	C/O
AZERBAIJAN	E/C/O
BELARUS	E/C/O
BELGIUM	A/C/O
BRAZIL	I
BULGARIA	E/A
CANADA	M/P
CHINA	F/J
CZECH REPUBLIC	C/O
DENMARK	C/O
FINLAND	C/O
FRANCE	A

Country	Type of Connection
GERMANY	C/O
GEORGIA	E/C/O
GREECE	A/B
HONG KONG	B
HUNGARY	A/Q
INDIA	B
INDONESIA	B
IRELAND	B
ITALY	N
JAPAN	G
KAZAKHSTAN	E/C/O
LUXEMBOURG	C/O
MALAYSIA	B
MEXICO	M/P/A

Country	Type of Connection
NEW ZEALAND	B
NORTH AFRICA	A
NORWAY	C/O
PHILIPPINES	L/B
POLAND	C
PORTUGAL	B
ROMANIA	A
RUSSIA	E/C/O
SINGAPORE	B
SLOVAKIA	C/O
SLOVENIA	C/O
SOUTH AFRICA	B
SOUTH KOREA	G
SPAIN	A

Country	Type of Connection
SWEDEN	C/O
SWITZERLAND	C/O
THAILAND	B
THE NETHERLANDS	C/O
TURKEY	B/C/O
UKRAINE	C/O
UNITED ARAB EMIRATES	A
UNITED KINGDOM	B
USA	M/P
VIETNAM	B

According to NF-E-29-664 Standard

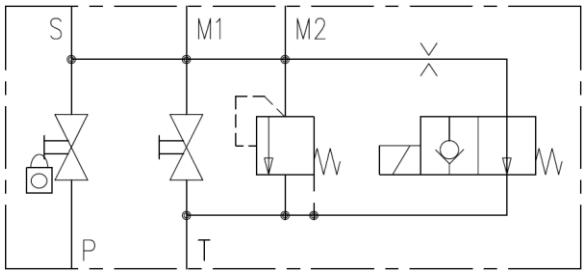


****Note:** The bladder accumulator model codes may require a different suffix code dependant upon the country
where the accumulator is being shipped. For the U.S. and Mexico this is an ASME suffix code, Ontario Canada
requires ASME plus TSSA certification, CE for Europe, CELO for China, NR-13 for Brazil and GOST for Russia. Other countries may have different certification requirements and the suffix code may change. Please check with Parker Hannifin for the requirements of the final destination country.

3.9.1 Accumulator Safety Blocks

(Link to Data Sheet)

Symbol



Product Overview

The Accumulator Safety Blocks are used for safety, isolation and unloading of Hydraulic Accumulators. Per OPEL specification a Safety Block is required for each Accumulator application. Each Safety Block is equipped with a manual unloading valve with locking handle, pressure relief valve and a 24V DC solenoid unloading valve. Standard orifice size of bleed-off is 1.5 mm.

Note:
Per OPEL specification, a pressure gauge is required between the Accumulator Safety Block and the Accumulator.

Accum. Size	**Ports** ISO 1179-1 G thread	**Size**	**Model Number**	
			Accum. Safety Block	Connecting Accessories
1 L	G ¾	DN 10	**SBAR10E1T1-210-TL1**	UEST-T-½ED
4 L	G 1¼	DN 10		UEST-T-1¼
10 L	G 2	DN 20	**SBAR20E1T1-210-TL1**	UEST-T-2
20 L	G 2	DN 20		
32 L	G 2	DN 30	**SBAR32E1T1-210-TL1**	UEST-F-2

Electrical connections are available for using standard plugs per EN 175301-803 or M12x1 plugs. In case of using M12x1 connectors additional adapter has to be order separately.

3.10 SUBPLATES

Steel or Ductile Iron Subplates with metric threads for valve bolt down.

Size	Ports ISO 1179-1 G thread	Description	Model Number	
NG6 (D03)	G 1/4	Bottom Ported	**SPD22B910**	**(Link to Data Sheet)**
	G 3/8	Bottom Ported	**SPD23B910**	
	G 1/2	Bottom Ported	**SPD24B910**	
NG10 (D05)	G 1/2	Bottom Ported	**SPD34B920**	
	G 3/4	Bottom Ported	**SPD36B920**	
NG16 (D07)	G 3/4	Bottom Ported with X & Y Ports	**SPD46B910**	
	G 1	Bottom Ported with X & Y Ports (X & Y ports are G 1/4)	**SPD48B910**	
NG25 (D08)	G 1-1/2	Bottom Ported with X & Y Ports (X & Y ports are G 1/2)	**SPD612B930**	

3.11 MANIFOLDS

Ductile Iron Manifolds with Bottom Ported Cylinder Port

Size	Ports ISO 1179-1 G thread	Number of Stations	Model Number	
NG6 (D03)	P & T: G ½ Both ends A & B: G 3/8 Bottom ported Gauge ports G ¼	2	**MSP2D23B910C**	**(Link to Data Sheet)**
		3	**MSP3D23B910C**	
		4	**MSP4D23B910C**	
		5	**MSP5D23B910C**	
		6	**MSP6D23B910C**	
		7	**MSP7D23B910C**	
NG10 (D05)	P: G 3/4 T: G 1 Both ends A & B: G 1/2 Bottom ported Gauge ports G ¼	2	**MSP2D34B930C**	
		3	**MSP3D34B930C**	
		4	**MSP4D34B930C**	
		5	**MSP5D34B930C**	
		6	**MSP6D34B930C**	

3.12 COVER PLATES

Size	Description	Model Number	
NG6 (D03)	Cover Plate (Blanking Plate with metric bolts and o-rings)	**D51VP071C**	**(Link to Data Sheet)**
NG10 (D05)	Cover Plate	**D51VP101D**	

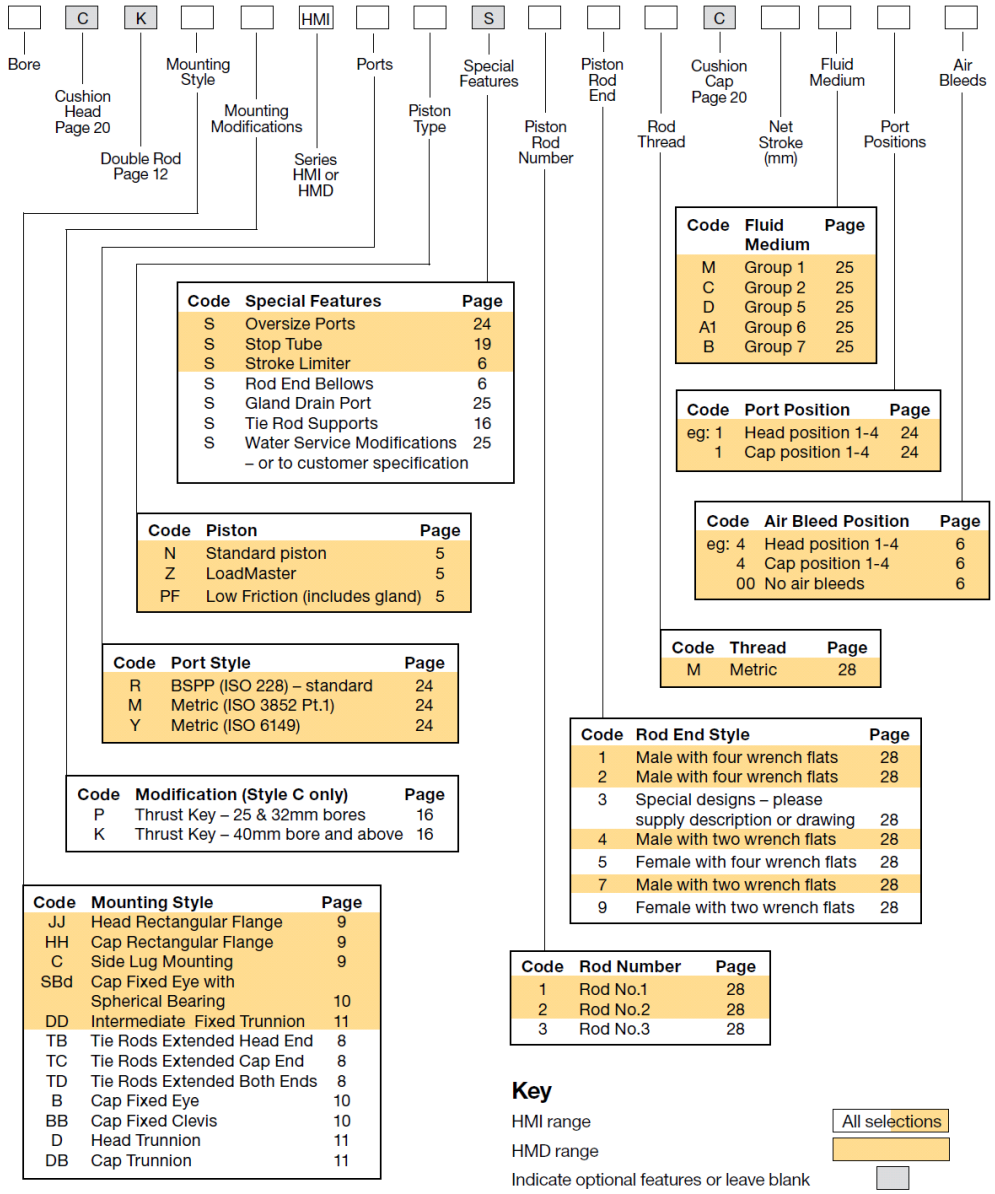
3.13 HYDRAULIC CYLINDERS ISO 6020/2

Parker website: **www.parker.com/Cylinder**

3.13.1 Parker HMI Cylinder

(Link to Data sheet)

How to Order ISO Cylinders **HMI and HMD Series**



Code	Special Features	Page
S	Oversize Ports	24
S	Stop Tube	19
S	Stroke Limiter	6
S	Rod End Bellows	6
S	Gland Drain Port	25
S	Tie Rod Supports	16
S	Water Service Modifications – or to customer specification	25

Code	Fluid Medium	Page
M	Group 1	25
C	Group 2	25
D	Group 5	25
A1	Group 6	25
B	Group 7	25

Code	Port Position	Page
eg: 1	Head position 1-4	24
1	Cap position 1-4	24

Code	Piston	Page
N	Standard piston	5
Z	LoadMaster	5
PF	Low Friction (includes gland)	5

Code	Air Bleed Position	Page
eg: 4	Head position 1-4	6
4	Cap position 1-4	6
00	No air bleeds	6

Code	Port Style	Page
R	BSPP (ISO 228) – standard	24
M	Metric (ISO 3852 Pt.1)	24
Y	Metric (ISO 6149)	24

Code	Thread	Page
M	Metric	28

Code	Rod End Style	Page
1	Male with four wrench flats	28
2	Male with four wrench flats	28
3	Special designs – please supply description or drawing	28
4	Male with two wrench flats	28
5	Female with four wrench flats	28
7	Male with two wrench flats	28
9	Female with two wrench flats	28

Code	Modification (Style C only)	Page
P	Thrust Key – 25 & 32mm bores	16
K	Thrust Key – 40mm bore and above	16

Code	Mounting Style	Page
JJ	Head Rectangular Flange	9
HH	Cap Rectangular Flange	9
C	Side Lug Mounting	9
SBd	Cap Fixed Eye with Spherical Bearing	10
DD	Intermediate Fixed Trunnion	11
TB	Tie Rods Extended Head End	8
TC	Tie Rods Extended Cap End	8
TD	Tie Rods Extended Both Ends	8
B	Cap Fixed Eye	10
BB	Cap Fixed Clevis	10
D	Head Trunnion	11
DB	Cap Trunnion	11

Code	Rod Number	Page
1	Rod No.1	28
2	Rod No.2	28
3	Rod No.3	28

Key

HMI range — All selections

HMD range

Indicate optional features or leave blank

Double Rod Cylinders – Example

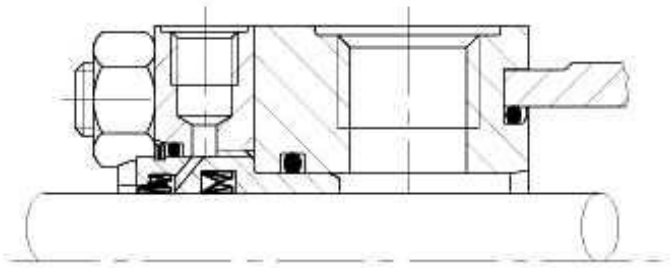
100	K	JJ	HMD	R	N	1	4	M	1	4	M	125	A1	11	44

Accessories

Please state on order whether accessories are to be fitted to the cylinder or supplied separately.

3.13.2 Gland Drain

Gland Drain Requirements



OPEL specification requires cylinders to have a gland drain port for an oil leak return system when certain application conditions are present. These conditions are listed below.

- When cylinders are located within the machine in such a way that they are hidden and cannot be viewed without removing the covering.
- If the cylinder is subject to coolant spray.
- If the cylinder stroke exceeds 10 times the piston diameter.
- The cylinder stroke speed is greater than 1 m/s

Additional Label

A second identical label is to be mounted by the machine builder in a location where it is clearly visible from outside the machine guarding. The additional labels should be ordered at the same time as the original cylinders.