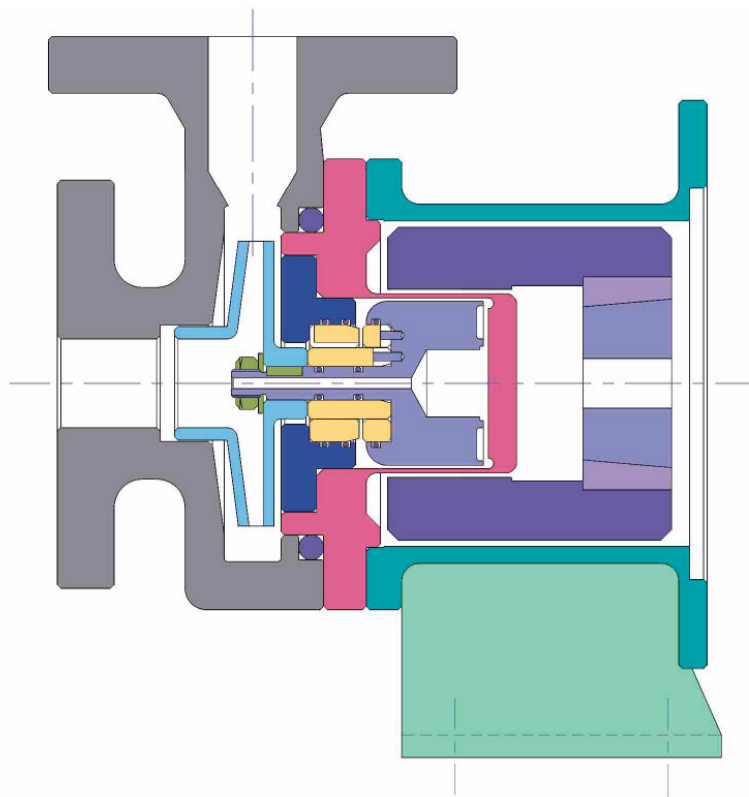


VERDERMAG
Global PC 80L

Maintenance Manual



***THIS DOCUMENT SHOULD STAY WITH THE PUMP
UNIT AT ALL TIMES!***

To be read in conjunction with Installation And Operating Manual

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1.0 DOCUMENTATION

1.1 Type Hydrostatic Test Certificate

Global Style 1 type PC

We hereby certify that the above specified equipment supplied by Verder has been hydrostatically tested in accordance with the current issue of procedure reference VMP.005 and is satisfactory in all respects thereof:-

Test Pressure: **24 barG**

Test Temperature: **20 °C**

1.2 Type Performance Test Certificate

(For units supplied with drive motor fitted by Verder Ltd in the UK)

Global type PC 80L

We hereby certify that the above specified equipment supplied by Verder has been tested in accordance with the current issue of procedure reference VMP.007 and meets the following requirements:-

- Standard relevant performance curve at trim diameter detailed on tag plate.
- Duty flowrate and differential pressure detailed within purchase order (where stated).

2.1 Assembly Instructions

Global PC 80L

The pump unit is assembled to the following procedure in accordance with the standard build specification (see relevant section).

Step 1 Cartridge Assembly

Items required

Reference	Description
3	Bearing holder
4	Casing joint
5	Backplate assembly
6	Pump shaft assembly
10.1	Front bearing assembly
10.2	Front bearing O-ring kit

Front bearing o-ring kits are separated into the two common size o-rings. The smallest set is fitted into the external grooves in the front of the pump shaft. The largest set is fitted into the internal grooves in the front of the pump shaft and the rear of the bearing holder.

Note: Care should be taken not to damage any o-rings. Any o-rings damaged during fitment should be replaced prior to continuation of assembly.

Bearing lubricant is applied to all surfaces machined with o-ring grooves. Front bearing components can now be fitted to onto/into the relevant components as follows:

Front bearing thrust ring -> Pumpshaft (front)
 Front bearing sleeve -> Pumpshaft
 Front bearing bush -> Bearing holder

Note: Care should be taken not to damage any bearing components particularly when passing over anti-rotation pins. Any bearings damaged during fitment should be replaced prior to continuation of assembly.



Warning.

Extreme care should be taken when handling damaged bearings. Silicon carbide is a very hard and brittle material. The edges of any fractures or breaks will be very sharp.

Position the backplate assembly on a flat surface with the flange upwards.

Note: Ensure that the pumpshaft is free from particles collected by the magnetised area.

The pump shaft can now be carefully lowered into the backplate assembly. To aid grip on the pumpshaft it may be useful to hand tighten the locknut onto the pumpshaft before lowering into the backplate assembly.

The bearing holder is fitted to the backplate assembly over the protruding pump shaft and secured using the supplied screws with fastener anti-seize. The screws should be tightened to a torque of 20Nm (14.4 ft.lb).

Where only a cartridge assembly is to be built/supplied the unit is hydrostatically tested in accordance with the relevant procedure. The result of the test is logged in the relevant section of the build sheet.

On completion of the test the casing joint, front impeller locknut/washer and the impeller key are secured to the unit.

Where a complete pump unit is required the following sections should be adhered to.

Step 2
Outer Magnet Assembly

Items required

Reference	Description
7.1	Outer magnet assembly
7.2	Taper lock adaptor
7.3	Taper lock bush
8.1	Pedestal

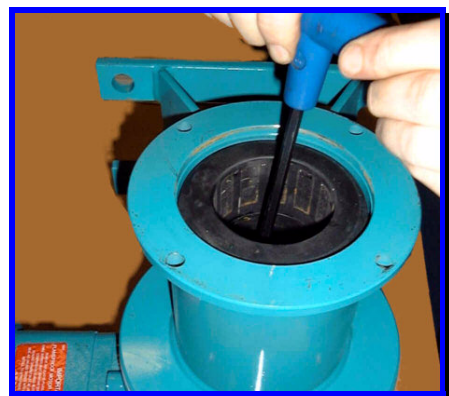
The motor is placed on its cowl with the motor shaft facing upwards. The pedestal is fitted onto the motor flange and secured using the supplied fasteners with fastener anti-seize.



The outer magnet complete with taper lock adaptor and bush are then lowered onto the motor shaft. The outer magnet setting distance of 5mm, taken from the highest point on the magnet assembly to the highest point on the pedestal (see picture), should now be checked.

Any adjustments in outer magnet height by lifting or lowering the magnet assembly. When the setting distance is correct the screws are tightened. The magnet height is then to be re-checked.

Note: The action of tightening the grub screws affects a 1-2mm increase in the setting distance. Account should be taken of this when setting the rotor.



Step 3
Pump 'wet end' Assembly

Items required

Reference	Description
-	Cartridge assembly
-	Outer magnet / pedestal/motor (when fitted) assembly
1	Casing
2	Impeller

Note:

Verder advise that where an impeller trim is required on a fabricated impeller, the unit is returned to our works in Leeds (UK). Trimming of a fabricated impeller may disturb the welding of the vanes. The impeller would therefore require re welding ensuring it was fit for purpose.

The impeller key is placed in the keyway of the pumpshaft.



The impeller is fitted to the shaft and secured with the impeller locknut and washer using fastener anti-seize. The locknut should be tightened to a torque of 40Nm (28.8 ft.lb).

The pedestal (bareshaft unit) or the pedestal/motor assembly are placed on a flat surface with the front of the pedestal facing vertically upwards. The cartridge assembly complete with impeller is then lowered into the pedestal.

Note: Care should be taken when passing the containment tube into the outer magnet assembly to ensure no damage is caused to the magnets.

The casing joint is then secured into the casing and is lowered onto the assembly and secured with the supplied fasteners using fastener anti-seize. The screws should be tightened to a torque of 40Nm (28.8 ft.lb).

2.2 On Site Disassembly Instructions

Global PC 80L

Generally disassembly should be carried out in the reverse order to the assembly instructions detailed above. However the some exceptions may apply dependant on site conditions etc.

2.3 Tag Plate

The tag plate will be supplied with 4 fixing studs and the model code, pump / serial number and test pressure already stamped.

VERDERMAG	
Model	
Date	/ /
Serial No.	
Impeller Ø	mm
Weight	kg
Test pressure	Bar
Speed	rpm
Flow	mCu/hr
Head	m
ATEX 01/03	Grp. II Cat. 2 GD c / k
Temp. class	
Max liquid temp.	
PED	Notified Body EC
DO NOT RUN DRY	
	
VERDER Ltd., Whitehouse Street, Leeds, LS10 1AD England	

See code sheet in Installation And Operating Manual

Date of construction

Serial number (required for reference)

Installed final diameter

Pump head weight

Hydrostatic test pressure

Nominal motor speed from motor tag plate

Nominal flowrate

Nominal differential head

ATEX classification (pump head only)

ATEX temperature classification

ATEX maximum allowable pump liquid temperature

* Pressure Equipment Directive notified body EC reference number

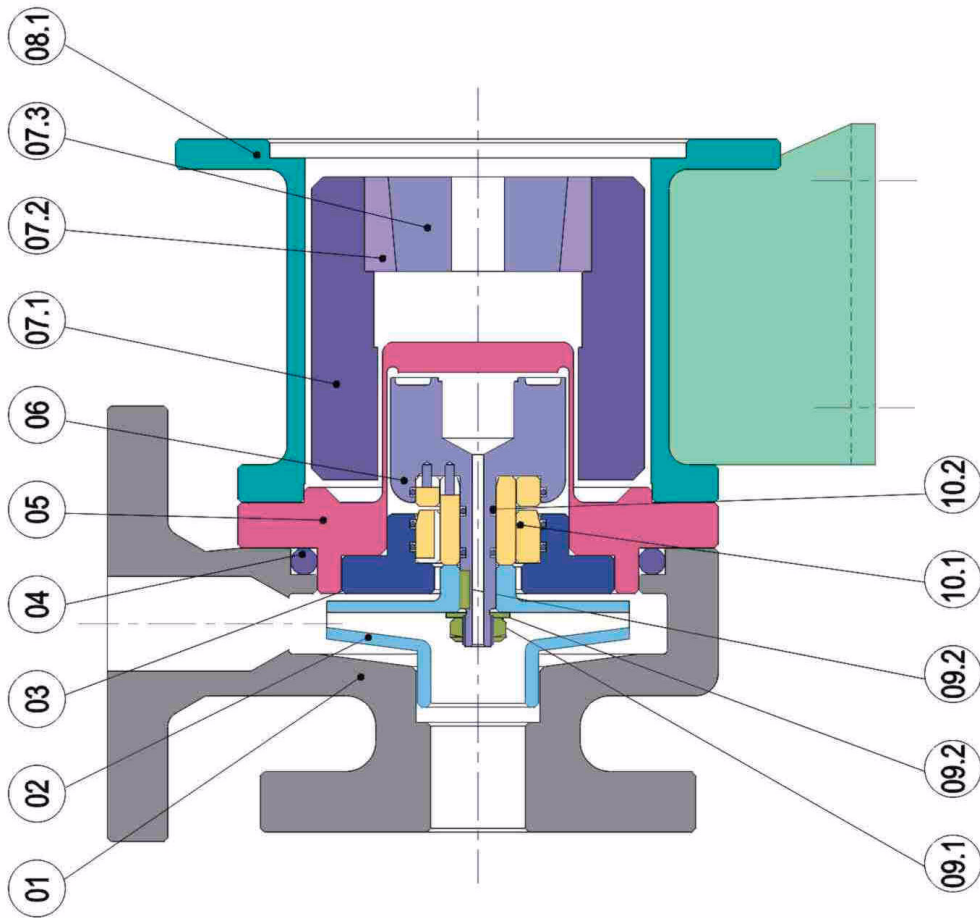
The pump model codes are detailed in the Installation And Operating Manual.

* This pump type falls into the list of excluded items contained within the 'Pressure Equipment Directive' 97/23/EC 29th May 1997.

2.4 Standard Sectional Assembly Drawing

ITEM N°	DESCRIPTION	QTY.
01	CASING	One
02	IMPELLER ASSEMBLY (*S3)	One
03	BEARING HOLDER	One
04	CASING JOINT/O-RING (1-OFF *S1) (1-OFF *S2)	One
05	BACK PLATE ASSEMBLY	One
06	PUMP SHAFT	One
07.1	OUTER ROTOR ASSEMBLY	One
07.2	OUTER ROTOR TAPER LOCK ADAPTOR	One
07.3	OUTER ROTOR TAPER LOCK BUSH	One
08.1	PEDESTAL	One
08.2	PEDESTAL ADAPTOR FLANGE (see item N° .08.1)	One
09.1	IMPELLER LOCKNUT (*S2)	One
09.2	IMPELLER WASHER (*S2)	One
09.3	IMPELLER KEY (*S2)	One
10.1	FRONT BEARING ASSEMBLY (SIZE 1) (*S2)	One
10.2	O-RING KIT (SIZE 1) (*S2)	One
—	CARTRIDGE ASSEMBLY (*S3)	One

RECOMMENDED SPARES:-
 *S1 COMMISSIONING SPARES
 *S2 2 YEARS OPERATIONAL SPARES
 *S3 HOLDING SPARES



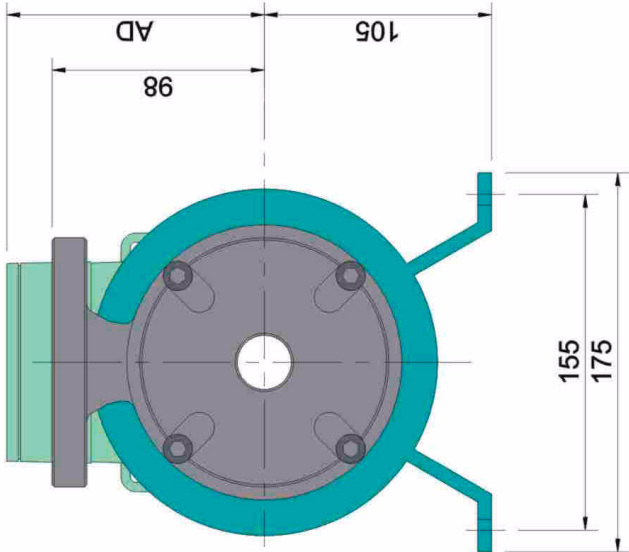
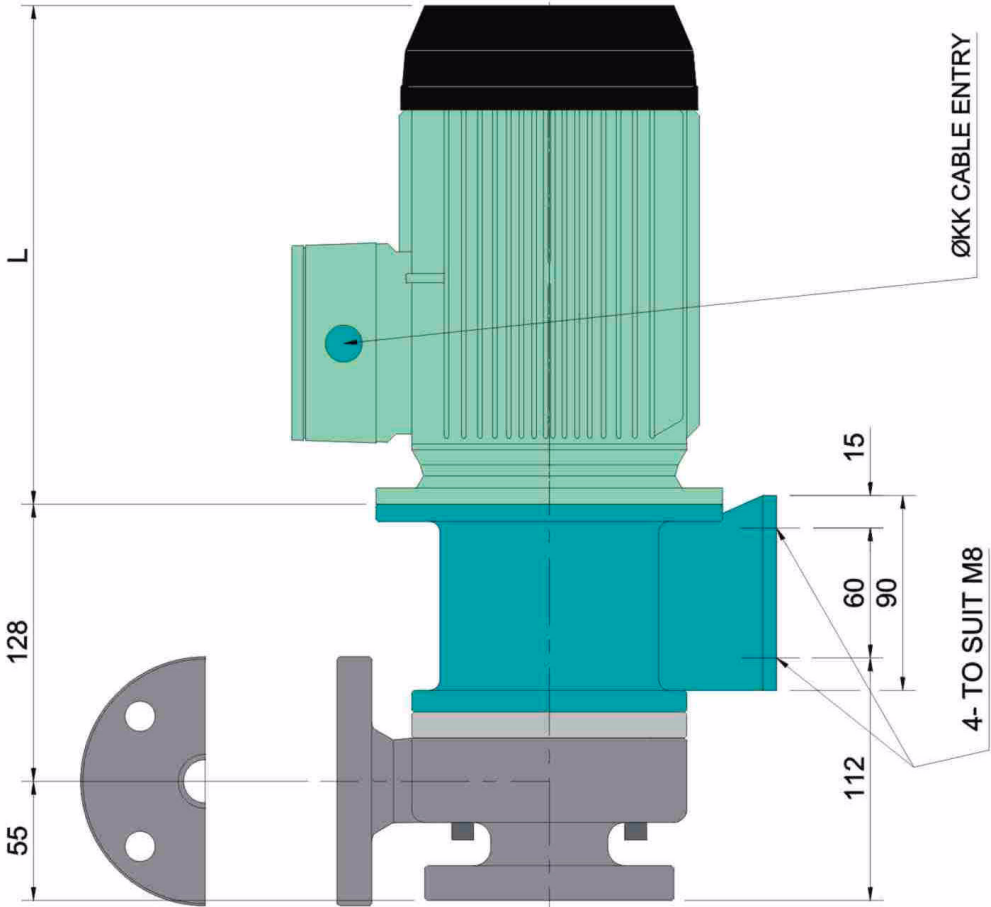
2.5 Component List

PC 80 L

Item	Part Number	Long Description	Material Specification
1	CAS.08011	80L CASING FABRICATED PN16 316LS11	STAINLESS STEEL 316S11 TO BS 1503
1	CAS.08013	80L CASING FABRICATED ANS1150LB 316LS11	STAINLESS STEEL 316S11 TO BS 1503
2	IMP.080L.00	IMPELLER 80-L STYLE 1 A1 SIC 316L SS	STAINLESS STEEL 316S11 TO BS 1503
3	BHR.080.00	BEARING HOLDER 80L SIC 316L	STAINLESS STEEL 316S11 TO BS 1503
4	VIT.080.00	O RING CASING JOINT 80L VITON E-60CBS341	VITON E-60C
4	EPDM.080.00	O RING CASING JOINT 80L EPDM BS341	ETHYLENE PROPYLENE TERPOLYMER
4	PTFE.080.00	O RING CASING JOINT 80L PTFE BS341	FEP ENCAPSULATED VITON
5	BPA.080.00	BACK PLATE ASSY 80L SIC 316L	STAINLESS STEEL 316S11 TO BS 1503 / HASTELLOY C276 TO ASTM-SB575-95
6	PSA.A1.00	PUMP SHAFT 80L A1 SIC 316L	STAINLESS STEEL 316S11 TO BS 1503 / HASTELLOY C276 TO ASTM-SB575-95
7	OMR.A1.00	OUTER MAGNET SIZE A1 TO SUIT T/LOCK 1210	MILD STEEL (En3B)
7	TLA.1210	TAPER LOCK ADAPTER 1210	070M20 TO BS 970Pt.1
7	TLB.1210/14	TAPER LOCK BUSH 1210 14mm BORE	070M20 TO BS 970Pt.1
8	PED.080.00	PEDESTAL 80L A1 D71 GPS STD	MILD STEEL (En3B)
9	FKF.080.SS.00	FASTENER KIT 80L LOCKNUT, WASHER & KEY	STAINLESS STEEL 316S11 (WASHERS 316S12) TO BS 1503
10.1	SCB.1	BEARING ASSY SILICON CARBIDE SIZE 1 (E4)	SILICON CARBIDE (SILICA FREE)
10.2	CSS.1	O-RING SET 316L FOR SCB SIZE 1	STAINLESS STEEL 316L
10.2	VIT.1	O-RING SET VITON FOR SCB SIZE 1	VITON E-60C
10.2	EPDM.1	O-RING SET EPDM FOR SCB SIZE 1	ETHYLENE PROPYLENE TERPOLYMER
10.2	PTFE.1	O-RING SET PTFE FOR SCB SIZE 1	FEP ENCAPSULATED VITON
10.2	KAL.1	O-RING SET KALREZ FOR SCB SIZE 1	KALREZ 4079 PERFLUOROELASTOMER

3.0 DIMENSIONS

3.1 Tabulated Drawing



3.2 Flange Standards

Pump Nomenclature

The pump nomenclature includes the essential information required to identify the pump type and the key elements of its hydraulics: -

Example: - PC 100 L for style 1 (sub-ISO) pumps, PC 50-32-125 for MII (ISO) pumps and HC 160 M for High pressure pumps.

The pump code is formatted as a combination of pump type, branch size (inlet / outlet) and nominal impeller size. It is prefixed with the pump type: -

PC - standard (16 bar) **P**ump **C**lose coupled, HC **H**igh system pressure pump **C**lose coupled.

For ISO pumps the remainder of the code details the inlet or suction bore, followed by the outlet or discharge bore, and lastly, the nominal impeller or pump frame size.

For Style 1 pumps, the remainder of the code details the nominal impeller or pump frame size, followed by a letter L for low flow, M for medium flow and H for high flow. These letters equate as follows: -

L = 25mm suction x 25mm discharge

M = 40mm suction x 25mm discharge

H = 50mm suction x 40mm discharge,

Flange Standards

Nominal bore size Metric - Actual	DIN Norm Flanges PN16	Nominal bore size Imperial - Equivalent	ANSI Norm Flanges 150#	ANSI Norm Flanges 300#	ANSI Norm Flanges 600# to 2500#
25mm	25mm	1"	1"	1"	1"
32mm	32mm	1 1/4"	1 1/2"	1 1/2"	1 1/2"
40mm	40mm	1 1/2"	1 1/2"	1 1/2"	1 1/2"
50mm	50mm	2"	2"	2"	2"
65mm	65mm	2 1/2"	2 1/2"	2 1/2"	2 1/2"
80mm	80mm	3"	3"	3"	3"
100mm	100mm	4"	4"	4"	4"
125mm	125mm	5"	5"	5"	5"
150mm	150mm	6"	6"	6"	6"

The pump code reflects the metric sizing. The coding for ANSI flanges is reflected in the more detailed part number (see separate chapter) and not as in ANSI standard pumps: -

e.g. 1515 to denote a 1.5" suction, 1" discharge and 5" nominal impeller.

Flange machining detail

For MII pumps, were the flanges are cast into the casing, the following tables outline our machining practice and indicate any deviations from standards.

Whilst it is possible to provide full 300lb flanges, in reality, the pump case is only rated to 16 bar at ambient, and this will become the limiting factor. By including flanges of a higher pressure rating does not mean the pump can be used for higher pressures.

3.3 PN16 Flange Dimensions

DNC	25mm (1")	32mm (1.1/2")	40mm (1.1/2")	50mm (2")	65mm (2.1/2")	80mm (3")	100mm (4")	125mm (5")	150mm (6")
DC	-	140	152	165	185	200	228	254	285
CC	-	18	19	20	20	24	24	26	26
FC	-	2	3	3	3	3	3	3	3
D1C	-	78	92	102	122	138	158	188	212
DM	115	140	150	165	185	200	220	250	285
CM	16	16	16	18	18	20	20	22	22
FM	2	2	3	3	3	3	3	3	3
D1M	68	78	88	102	122	138	158	188	212
KM	85	100	110	125	145	160	180	210	240
No. Holes	4	4	4	4	4	8	8	8	8
Dia. Holes	14	18	18	18	18	18	18	18	18

Notes:

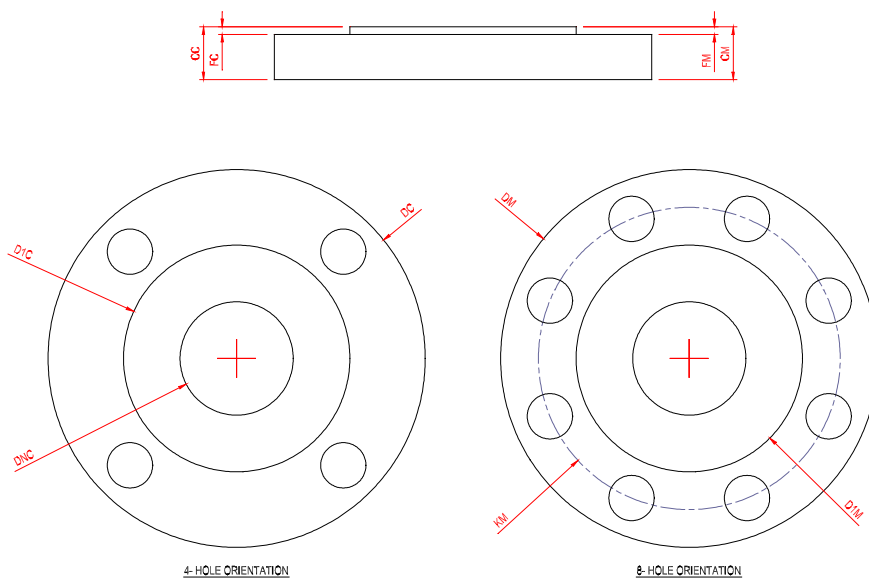
FLG OD	OK	AS CAST	OK	AS CAST	AS CAST	AS CAST	OK	OK	AS CAST
THK'	OK	OK	OK	OK	OK	OK	OK	OK	OK
R/F OD	OK	AS CAST	OK	AS CAST	AS CAST	AS CAST	AS CAST	AS CAST	AS CAST
HOLE ON									
FLG OD	8	11	11	11	11	11	11	11	13.5

Items suffixed with C for cast dimensions

Items suffixed with M for machined dimensions

Where OD of flange and raised face are as cast dimensions. A full 'clean up' of surfaces is required. Tolerance of OD +/-4.00mm, R/F OD +2.00/-1.00mm

General flange detail



3.4 ANSI.150 Flange Dimensions

DNC	25mm (1")	32mm (1.1/2")	40mm (1.1/2")	50mm (2")	65mm (2.1/2")	80mm (3")	100mm (4")	125mm (5")	150mm (6")
DC	-	140	152	165	185	200	228	254	285
CC	-	18	19	20	20	24	24	26	26
FC	-	2	3	3	3	3	3	3	3
D1C	-	78	92	102	122	138	158	188	212
DM	108	127	127	152	178	190	229	254	279
CM	14.3	17.5	17.5	19	22.2	23.8	23.8	23.8	25.4
FM	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
D1M	50.8	73	73	92.1	104.8	127	157.2	185.7	215.9
KM	79.4	98.4	98.4	120.6	139.7	152.4	190.5	215.9	241.3
No. Holes	4	4	4	4	4	4	8	8	8
Dia. Holes	15.9	15.9	15.9	19	19	19	19	22.2	22.2

Notes:

FLG OD	OK	OK	OK	OK	OK	OK	AS CAST	AS CAST	OK
THK'	OK	OK	OK	OK	AS CAST	OK	OK	OK	OK
R/F OD	OK	OK	OK	OK	OK	OK	OK	OK	OK
HOLE ON									
FLG OD	6.35	6.35	6.35	6.2	9.65	9.3	9.75	7.95	7.75

Items suffixed with C for cast dimensions

Items suffixed with M for machined dimensions

Where OD of flange and raised face are as cast dimensions. A full 'clean up' of surfaces is required. Tolerance of OD +/-4.00mm, R/F OD +/-0.8mm.

3.5 ANSI.300 Flange Dimensions

DNC	25mm (1")	32mm (1.1/2")	40mm (1.1/2")	50mm (2")	65mm (2.1/2")	80mm (3")	100mm (4")	125mm (5")	150mm (6")
DC	-	-	-	-	-	-	-	-	-
CC	-	-	-	-	-	-	-	-	-
FC	-	-	-	-	-	-	-	-	-
D1C	-	-	-	-	-	-	-	-	-
DM	124	156	156	165	190	210	254	279	318
CM	17.5	20.6	20.6	22.2	25.4	28.6	31.8	34.9	36.5
FM	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
D1M	50.8	73	73	92.1	104.8	127	157.2	185.7	215.9
KM	88.9	114.3	114.3	127	149.2	168.3	200	235	269.9
No. Holes	4	4	4	8	8	8	8	8	12
Dia. Holes	19	22.2	22.2	19	22.2	22.2	22.2	22.2	22.2

Notes:

FLG OD	OK	OK	OK	OK	OK	OK	OK	OK	OK
THK'	OK	OK	OK	OK	OK	OK	OK	OK	OK
R/F OD	OK	OK	OK	OK	OK	OK	OK	OK	OK
HOLE ON									
FLG OD	8.05	9.75	9.75	9.5	9.3	9.75	15.9	10.9	12.95

Items suffixed with C for cast dimensions

Items suffixed with M for machined dimensions

Where OD of flange and raised face are as cast dimensions. A full 'clean up' of surfaces is required. Tolerance of OD +/-4.00mm, R/F OD +/-0.8mm.

Flange sizes detailed without cast dimensions to be fitted with pre-machined flanges.