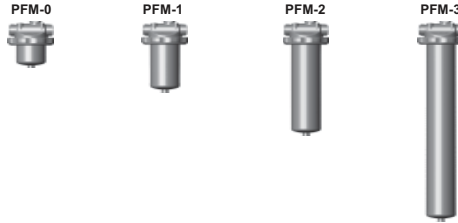




Process Filters Low, Medium, High Pressure PFL, PFM, PFH

up to 120 l/min, up to 100 bar



1. TECHNICAL SPECIFICATIONS

1.1 GENERAL

HYDAC stainless steel inline filters, type PFL, PFM and PFH are designed for use in industrial processing plants. They are suitable for separating contamination from low and high viscosity fluids. The range of different sizes, filter materials and sealing materials means that the filters can be adapted to the particular application conditions.

Depending on the required cleanliness level, the following stainless steel filter elements can be used: Chemicon®, pleated wire mesh or slotted tube.

Contamination of the filter elements can be monitored by means of a clogging indicator (differential pressure monitoring) fitted to the filter.

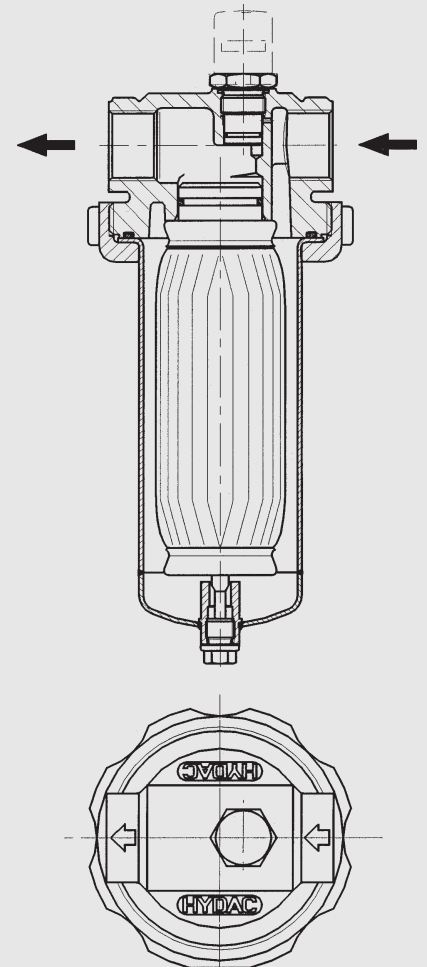
The direction of flow through the filter elements is from the outside to the inside. They can be cleaned several times, thereby saving the costs of disposal and re-purchase.

1.2 SUMMARY OF AVAILABLE SIZES AND CONNECTIONS

Series	Connection size	Pressure range
PFL	G 1	PN 10
PFM	G 1	PN 40
PFH	G 1	PN 100

The selection of filter bowl length depends on the level of contamination in the fluid and on the associated filter area.

1.3 SECTIONAL FUNCTION DRAWING



2. FILTER SPECIFICATIONS

2.1 SUMMARY OF TECHNICAL SPECIFICATIONS OF FILTER HOUSING (STANDARD CONFIGURATION)

Series	Size	Connection size	Materials		Max. operating pressure [bar]	Max. temperature [°C]	Weight [kg]	Volume [l]			
			Housing	Lock nut							
PFL	0	G 1	Stainless steel	Synthetic	PN 10	100	3.7	0.4			
	1						4.1	0.8			
	2						4.7	1.6			
	3						5.9	3.2			
PFM	0			Stainless steel			Stainless steel	PN 40	100	4.4	0.4
	1									4.9	0.8
	2									5.6	1.6
	3									6.8	3.2
PFH	0	Stainless steel	Stainless steel	PN 100	100	4.5	0.4				
	1					5.0	0.8				
	2					5.7	1.6				
	3					6.9	3.2				

* max. operating temperatures will reduce the pressure range:
 PFM: max. 200 °C at $p_{max} = 16$ bar
 PFH: max. 200 °C at $p_{max} = 75$ bar

2.2 FURTHER SPECIFICATIONS OF THE FILTER HOUSING (STANDARD CONFIGURATION)

2.2.1 Seal materials
 FPM (Viton)

2.2.2 Documentation
 Operating and maintenance instructions

2.3 SUMMARY OF TECHNICAL SPECIFICATIONS OF FILTER ELEMENTS

Size	Filter area [cm ²]		Filter materials and filtration ratings [µm]				Permiss. Diff. pressure across element [bar]
	Pleated element	Slotted tube	Chemicon® (metal fibre)	wire mesh	Slotted tube (with bonded end caps)	Slotted tube (with welded end caps)	
SZ-0	676	116	1, 3, 5, 10, 20	25, 40, 60, 100, 150, 200, 250	50, 100, 150, 200, 250	40	
SZ-1	1710	262					
SZ-2	3421	552					
SZ-3	6842	1133					

2.4 OPTIONAL VERSIONS

There is a range of optional versions available for the PFL/PFM/PFH process filters. For technical details and prices, please contact our Technical Sales Department at Head Office.

2.4.1 Flange connections

Various adaptations to the cylindrical pipe thread are available to suit flanges:

- DIN
- ANSI
- JIS

These can be either piped or welded

2.4.2 Seal materials

- FEP encapsulated Viton seals
- Various seal materials on request, depending on the resistance to the fluid

2.4.3 Differential pressure monitoring

- Visual
- Electrical
- Visual-electrical
- Option of piping indicator separately for fluid temperatures > 100 °C

2.4.4 Filter elements

- Welded end caps on slotted tube filter elements
- Support spring

2.4.5 Duplex filter model

All PFL, PFM and PFH are available as duplex filters including pipework and change-over valve

2.4.6 Documentation

- Manufacturer's test certificates
- Material certificates (3.1 according to DIN EN 10204)
- and many others on request

Further optional models un request.

3. MODEL CODE

3.1 FILTER HOUSING PFL/PFM/PFH

PFL - 1 - G - 2 - V - X - L24 / ES

Filter type

- PFL (synthetic lock nut)
- PFM (stainless steel lock nut)
- PFH (stainless steel lock nut)
- PFLU **
- PFMU **
- PFHU **

Size

- 0 = short filter bowl
- 1 = medium filter bowl
- 2 = long filter bowl
- 3 = very long filter bowl

Type of connection

- G = threaded connection 1"

Clogging indicator

- 0 = without clogging indicator
- 1 = visual indicator (PVD 2 B.1)
- 2 = visual-electrical indicator
VA (PVD 2 D.0/-L..)
- 6 = electrical clogging indicator
(PVD 2 C.0)

*

Seal material

- V = FPM (Viton)
- T = FEP encapsulated
- Other seals on request

Modification number

- X = the latest version is always supplied

Supplementary details

Element code

* see Brochure on Clogging Indicators for Process Filters
No. 7.706../..

** on request

3.2 FILTER ELEMENT

SZ - 1 - 20 - M - V

Type of element

Size

- 0
- 1
- 2
- 3

Filtration rating in µm

- 1; 3; 5; 10; 20 Chemicon® (metal fibre)
- 25; 40; 60; 100; 150; 200; 250 (wire mesh)
- 50; 100; 200; 300; 500; 1000; 1500; 2000 (slotted tube)

Material of filter element

- M = Chemicon® (metal fibre)
- MS = Chemicon® (metal fibre) with support spring
- D = wire mesh
- DS = wire mesh with support spring
- S = slotted tube

Seal material

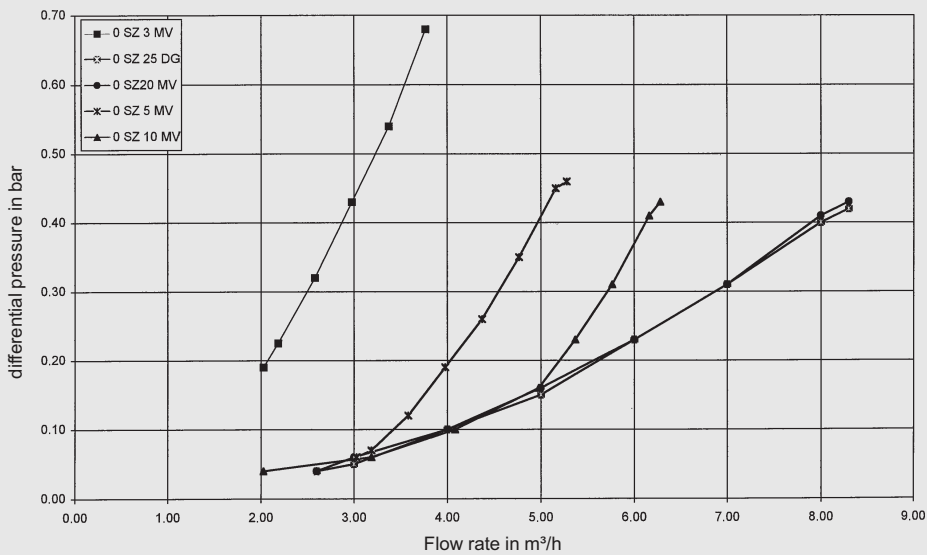
- V = FPM (Viton) O-ring
- T = FEP encapsulated O-ring
- Other seals on request

4. FILTER CALCULATION / SIZING

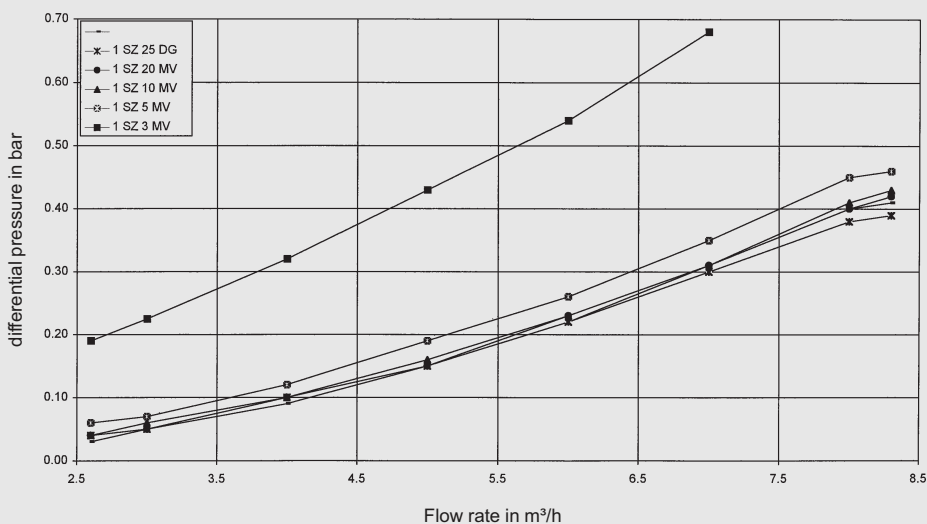
The curves apply to water at 20°C or fluids up to 15 mm²/s

4.1 PRESSURE DROP CURVES HOUSING

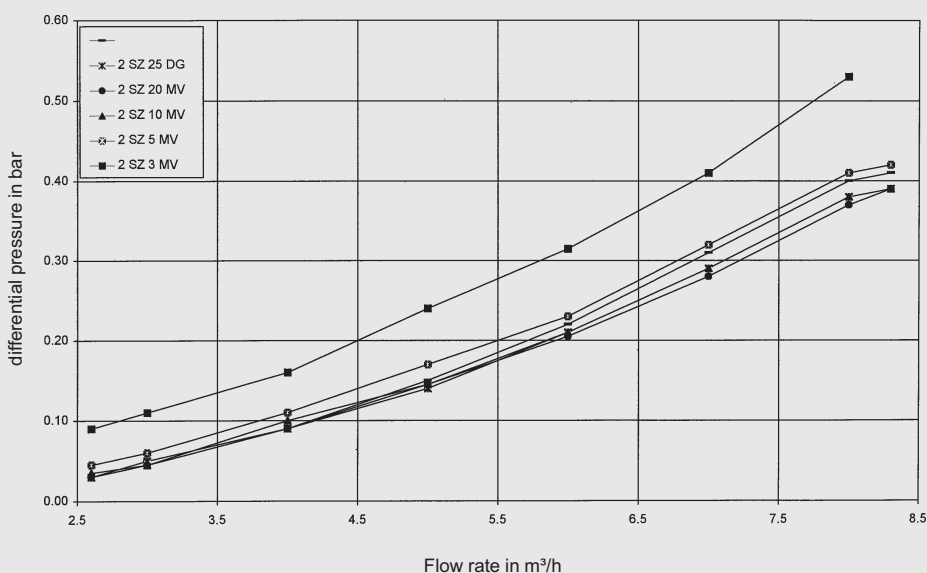
4.1.1 Pressure drop PFL/PFM/PFH Size 0



4.1.2 Pressure drop PFL/PFM/PFH Size 1



4.1.3 Pressure drop PFL/PFM/PFH Sizes 2 and 3



In order to be able to size the filter correctly, the following design data should be available:

- Flow rate
- Type of medium
- Materials / resistance
- Viscosity
- Required filtration rating
- Particulate loading in the fluid
- Type of contamination
- Operating pressure
- Operating temperature

Use the pressure drop curves to calculate the Process Inline Filters PFL, PFM and PFH. Generally speaking, an initial Δp (clean condition of the filter) of > 0.2 bar should not be exceeded.

A further factor in the calculation is the flow velocity through the flange inlet. It should not exceed 4 m/s.

4.2 FILTRATION PERFORMANCE

- Retention rates for wire mesh and slotted tubes:

Nominal retention rates

The filtration ratings given in the model code for these qualities are based on a HYDAC factory standard filter test.

This test is carried out by introducing a large amount of dust (ISO MTD) at the beginning of the filter test and subsequently separating the contamination particles over 1 hour. The test filter must retain 90 - 95 % of all particles larger than the given filtration rating.

- Retention rates for Chemicon® (metal fibre):

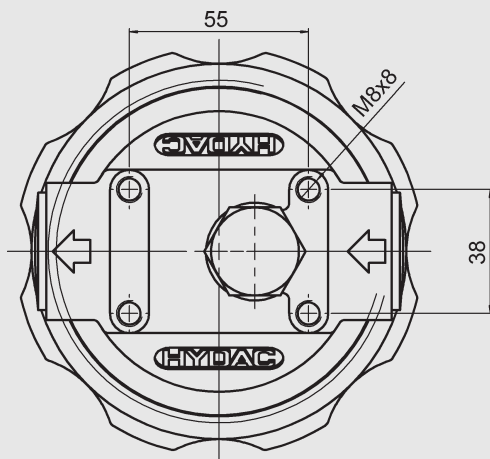
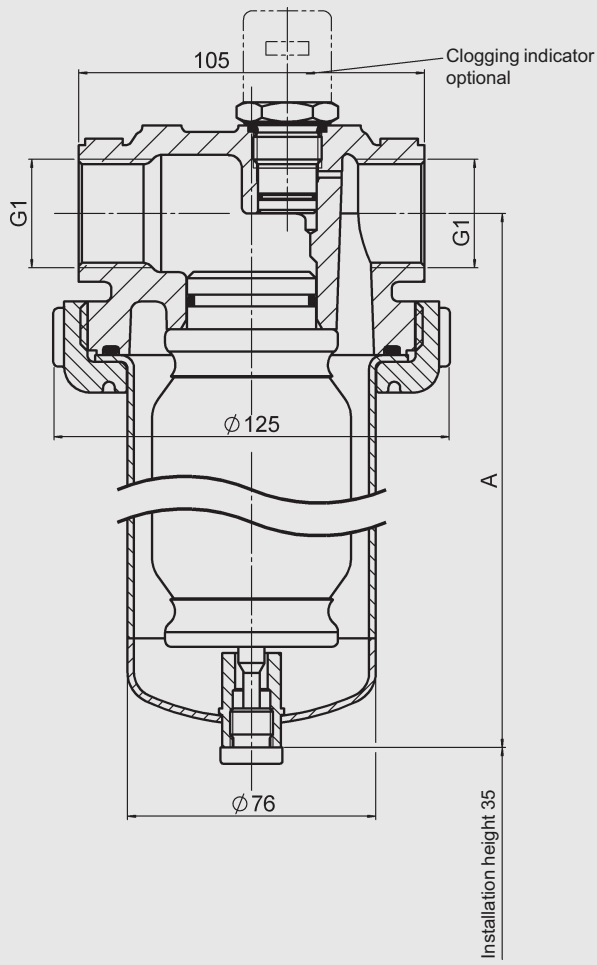
Absolute retention rate

The rates given in the brochure are determined by the multi-pass test carried out on the HYDAC test rig, based on ISO 4572 (multi-pass test for the determination and proof of the filtration performance, extended to finest filtration).

In this test at least 99 % of all particles larger than the given filtration rating must be retained and this up to the max. permissible differential pressure across the filter element. A filtration rate of 99 % corresponds to a β_x value of 100 ($\beta_x = 100$), which denotes absolute filtration.

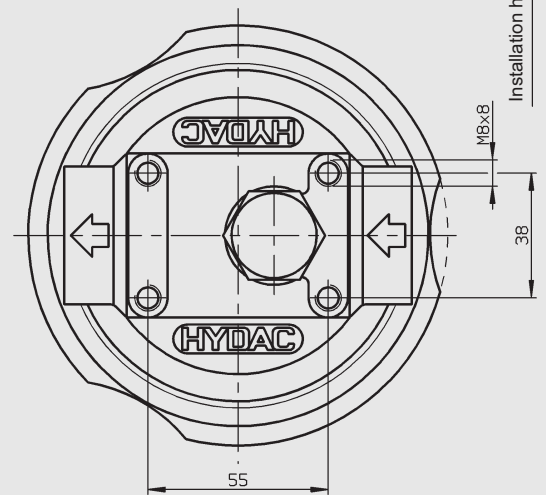
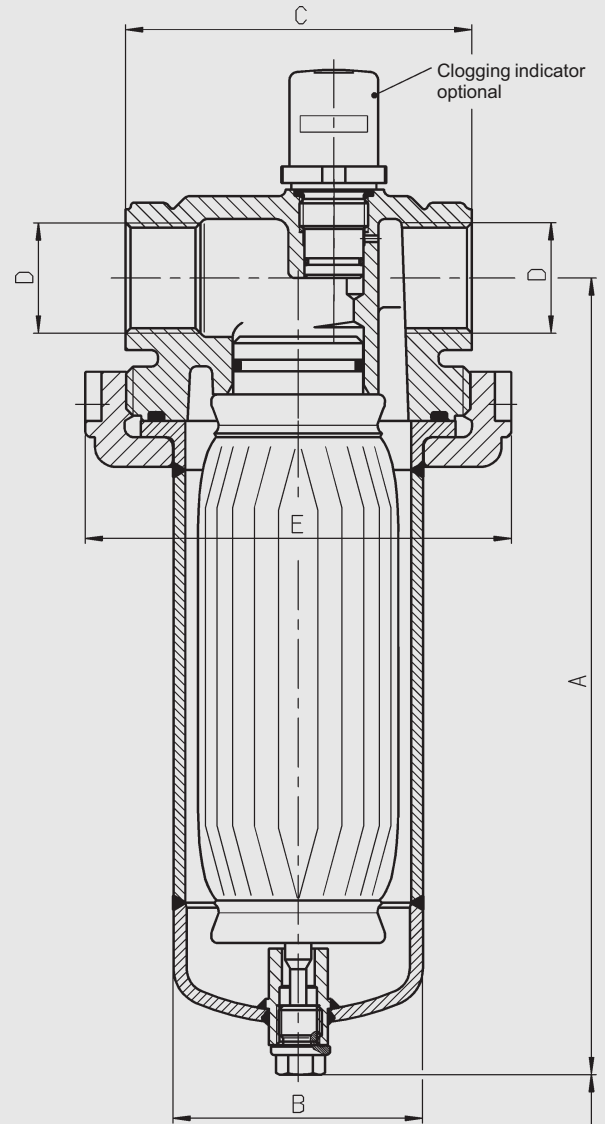
5. DIMENSIONS

5.1 SINGLE HOUSING PFL/PFM



Size	A	Installation height
0	146	35
1	240	35
2	400	35
3	725	35

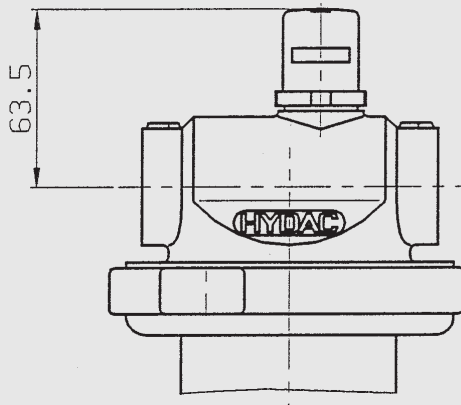
5.2 SINGLE HOUSING PFH



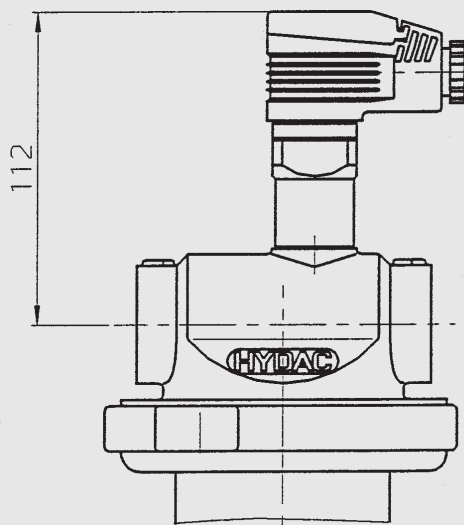
Size	A	B	C	D	E	F
0	146	76.1	106	G1	130	35
1	240	76.1	106	G1	130	35
2	400	76.1	106	G1	130	35
3	729.5	76.1	106	G1	130	35

5.3 CLOGGING INDICATORS

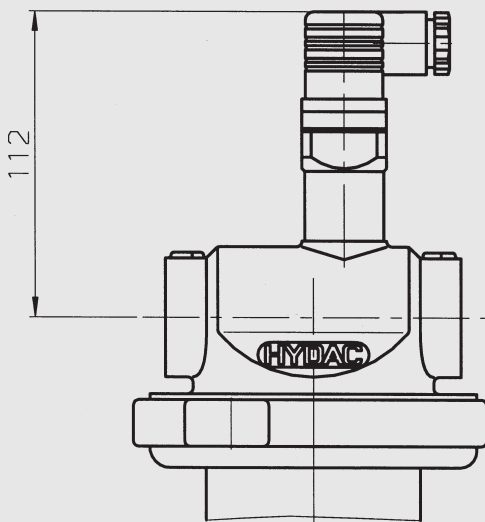
5.3.1 Visual clogging indicator



5.3.2 Visual electrical indicator

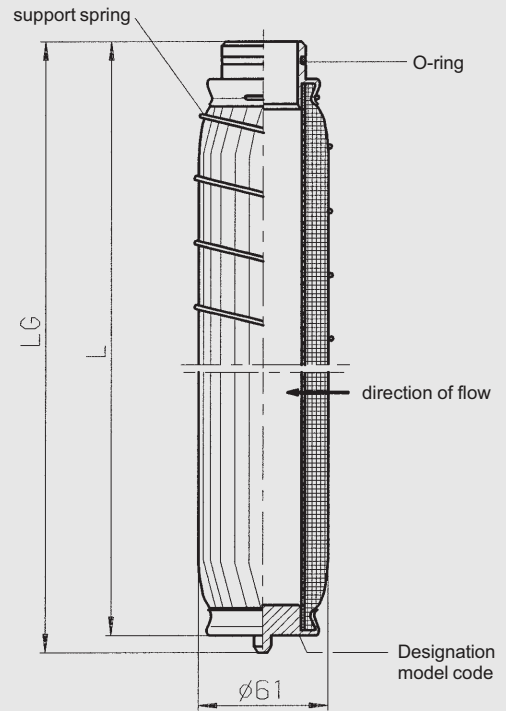


5.3.3 Electrical clogging indicator



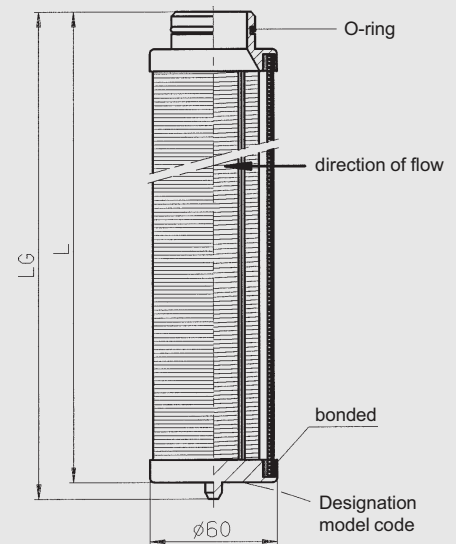
5.4 FILTER ELEMENTS

5.4.1 Wire mesh



Size	L	LG	O-ring size
0	88	96	34.6 x 2.6
1	185	193	34.6 x 2.6
2	347	355	34.6 x 2.6
3	672	680	34.6 x 2.6

5.4.2 Slotted tube



Size	L	LG	O-ring size
0	88	96	34.6 x 2.6
1	185	193	34.6 x 2.6
2	347	355	34.6 x 2.6
3	672	680	34.6 x 2.6

NOTE

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

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