

Following are the Accessories used in the Hydraulic Systems

**Filler Breather**

**Specifications**

Model Code	Filtration Ratings $\mu\text{m}$	Rated Air Flow L/min.
FB - 250 - TT - 40	40	250
FB - 700 - TT - 40	40	700
FB - 700 - SM - 40	40	700

**Method of Representation:** According to Model Code in the above table.



Graphic Symbol



**Suction Strainer**

**Specifications**

Model Code	Filtration Ratings $\mu\text{m}$	Mounting Thread Size BSP.F	Nominal Flow Rating L/min.
SFS - 15L	125 (150 Mesh)	1/2	15
SFS - 30L		3/4	30
SFS - 60L		1	60
SFS - 125L		1 1/2	125
SFS - 250L		2	250
SFS - 340L		2 1/2	340
SFS - 450L		3	450

**Method of Representation:** According to Model Code in the above table.



Graphic Symbol



**Level Gauge**

**Specifications**

Model Code	Pitch between Bolt Center Inches	Options
LG2 - 03	3	-
LG2 - 05	5	-
LG2 - 10	10	-
LG2 - 05T	5	With thermometer

**Method of Representation:** According to Model Code in the above table.



With Thermometer



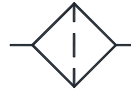
Graphic Symbol



**Pressure Line Filter**

**Specifications**

Parameter \ Series	100 L	250 L	400 L
Max. Oper. Pressure Kg/cm <sup>2</sup>	100	250	400
Flow Rate L/min.	6 ~ 360	10 ~ 460	10 ~ 460
Degree of Filtration (μm)	1 ~ 100	1~100	1~100
Indicator	40	40	700



Graphic Symbol



**Method of Representation:** According to Model Code in the table below.

100	L	140	G25.			R	-M	V	4	4	G	P	E	
Nominal Pressure Kg/cm <sup>2</sup>	Mounting	Flow	Filter Element			Connection	Perm. <sup>2</sup> Magnet	Bypass Valve	P.D. Indicators			Seals	Additi- onal Details	
			Materials	Filtration μm	Differential Pressure ΔP Kg/cm <sup>2</sup>				1: Opp. Press. 1.5 Kg/cm <sup>2</sup>	4: Opp. Press. 4.2 Kg/cm <sup>2</sup>	6: Opp. Press. 6 Kg/cm <sup>2</sup>			
100	L: Line Filter for Installation in Pressure lines	Based on Nominal Through-put L/min. with G25 element at 30mm <sup>2</sup> /s]	Cleanable	G	100, 60 40, 25, 10	•: 30 (Standard)	R: BSP.F Thd.  R1: <sup>1</sup> 3/8 BSP.F Thd.	O: Not Fitted				O: Not Fitted	O: Not Fitted	1: Optical
				M	10, 5									
250	F: Manifold Mounting	10, 18, 32, 56, 90, 140, 225, 360, 460	Disposable	P	25, 10,5	•1: 60	F: Flange	M: Fitted	V: Fitted	4: Opt.- Electrical Switch- over type	4: Opp. Press. 4.2 Kg/cm <sup>2</sup>	GL: Opp. Press. 4.2 Kg/cm <sup>2</sup>	E: Ethylene Propylene	VA: All s/s Construc- tion
				K	25, 10	•2: 160								
400	F: Manifold Mounting	10, 18, 32, 56, 90, 140, 225, 360, 460	Disposable	H	20, 10 6, 3, 1	•3: 330	FG: With Mating flange	M: Fitted	V: Fitted	4: Opt.- Electrical Switch- over type	6: Opp. Press. 6 Kg/cm <sup>2</sup>	GL: Opp. Press. 4.2 Kg/cm <sup>2</sup>	T: Teflon	E: Air Vent

- \* 1: Applicable only for 16L6.
- \* 2: Ring magnets are free of non-ferrous metal.  
Rod magnets can be fitted with non-ferrous spacers.

**Return Line Filter**  
(E.g.: Tank Top Type)

**Specifications**

Model Code	Flow Rating L/min.	Filtration Rating (μm)	Nominal Flow Rating L/min.
RLF-04-* -TT-VI	40	10 & 25	1/2
RLF-06-* -TT-VI	115		3/4
RLF-08-* -TT-VI	150		1
RLF-10-* -TT-VI	230		1 1/4
RLF-12-* -TT-VI	275		1 1/2

\* Mark shows Filtration Rating.



Graphic Symbol



**Method of Representation:** According to Model Code in the above table.

**Pressure Gauge**

**Specifications**

Type of Mounting	Dial size mm	Pressure Range Kgf/cm <sup>2</sup>	Thread Size
Face mounting Back Entry (FB)	φ 63	0 ~ 6 to 0 ~ 1400	1/4 BSP.F
	φ 100		3/8 BSP.F
Surface mounting Bottom Entry (SB)	φ 150		1/2 NPT

Accuracy : ± 1% of full scale Deflection

**Method of Representation:**

Dial Size-Pressure Range – Type of Mounting -Glycerine filled (Option)



Graphic Symbol



**Temperature Gauge**

**Specifications**

Type of Mounting	Dial size mm	Temp. Range °C	Thread Size BSP.F
Face mounting Back Entry (FB)	φ100	0 ~ 120	1/2
	φ 150		3/4
Surface mounting Bottom Entry (SB)	φ 250		

Accuracy : ± 1% of full scale Deflection

**Method of Representation:**

Dial Size- Temperature Range – Type of Mounting



Graphic Symbol



**Gauge Isolator**

**Specifications**

Number of Stations	Model Code	Max. Pressure Kgf/cm <sup>2</sup>	
Single	FGI-01	352	
Multi	5 Stations		FGI-05
	6 Stations		FGI-06

**Port Connection :** ¼ BSP.F Thd.

**Method of Representation:**

According to Model Code in the above table.



Graphic Symbol



**Pulsation Dampener**

**Specifications**

Model Code	Port Size		Max. Working Pressure Kgf/cm <sup>2</sup>
	Outlet BSP.F	Inlet N P T	
UPD 150	¼	¼	150
UPD 250	½	¼	250
	¾	¼	



Graphic Symbol



**Method of Representation:**

Model Code – Outlet Port x Inlet Port

**Drive Coupling**

**Specifications**

Model Code		Horse Power Capacity at 1500 r/min	Dimensions in mm			
Coupling Type	Size		Bore size		OD	L
			Min.	Max.		
L	95	4.5	10	28	54	63
	100	9.9	10	38	65	83
	110	18.75	15	42	85	108
	150	30.00	15	48	96	115
	190	40.50	20	60	115	133
	225	55.50	20	65	127	153
	226	69.90	25	70	137	178



Graphic Symbol

**Method of Representation:**

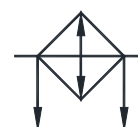
According to Model Code in the above table.

**Oil Coolers**

**Water type Oil Cooler**

**Specifications**

Model Code	Oil Flow L/min.	Heat Dissipation (kcal/hr)	Cooling Water L/min.	Pipe Connection Outer Dia. mm	
				Oil	Water
SHT-1	25	6,750	75	20	25
SHT-2	50	13,500	150	25	50
SHT-3	100	27,000	175	40	50
SHT-4	200	54,000	300	50	65
SHT-5	300	81,000	450	65	75
SHT-6	500	135,000	750	75	100



Graphic Symbol

Oil Inlet Temperature : 60<sup>0</sup>C; Cooling Water Inlet Temperature : 32<sup>0</sup>C.

Oil Outlet Temperature : 50<sup>0</sup>C; Oil side Pressure Drop: 1 Kgf/cm<sup>2</sup>.

\* Viscosity of Oil: 45 cSt. At 40<sup>0</sup>C.

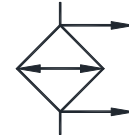
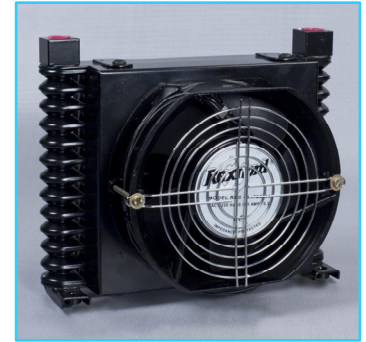
**Method of Representation:** According to Model Code in the above table.

**Air Blast Type Oil Cooler**

**Specifications**

Model Code	Heat Dissipation (kcal/hr)	Inlet and Outlet Pipe Connection		Fan Dia. Inches
		Size BSP.F	Between Centers Inches	
DKL20	2,000	3/4	5	12
DKL35	3,500	3/4	5	16
DKL50	5,000	3/4	5	16
DKL70	7,000	1	5	18
DKL90	9,000	1	5	18

Oil Inlet Temperature : 60<sup>0</sup>C; Cooling Water Inlet Temperature : 32<sup>0</sup>C.  
 Oil Outlet Temperature : 50<sup>0</sup>C; Oil side Pressure Drop: 1 Kg/cm<sup>2</sup>. AL  
 \* Viscosity of Oil: 45 cSt. At 40<sup>0</sup>C.

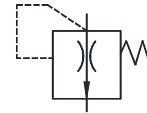
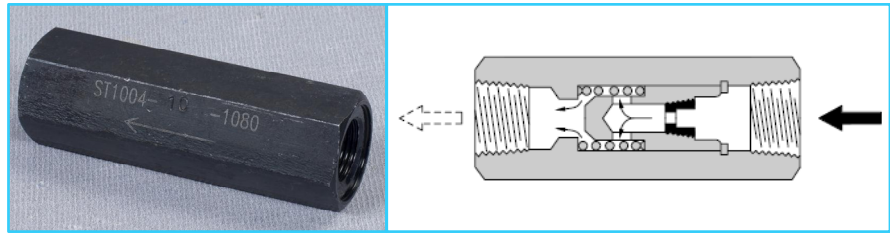


Graphic Symbol

**Air Bleed Valves**

**General Information**

This valve is designed to use when a pump starts to bleed off the air which is enclosed in a suction line or another lines in the system.



Graphic Symbol

**Specifications**

Model Numbers	Max. Operating Pressure Kgf/cm <sup>2</sup>	Reseating Pressure Kgf/cm <sup>2</sup>	Cracking Pressure Kgf/cm <sup>2</sup>	Flow Rate to Reseating L/min.	Range of Usage to Pump Output Flow L/min.	Approx. Mass Kg.
ST1004-5-1080	250	1.5	3.4	5	20 to 75	0.2
ST1004-10-1080				10	Over 75	

**Model Number Designation**

ST1004	-5	-10	80
Series Number	Flow Rate to Reseating	Design Number	Design Standard
<b>ST1004:</b> Air Bleed Valve	<b>5:</b> 5 L/min. <b>10:</b> 10 L/min.	10	80

**Instructions**

When this valve is used to bleed off the air for pump start, connect inlet port of the valve adjacent as much as possible to the discharge port of the pump.

For the purpose of removing the air in the line, install the air bleed valve at the highest point in the overall circuit.

In either case, outlet port of the valve must be connected to the tank line and it should be extended under the oil level in the reservoir.

**Hydraulic Fluids**

**Type of Hydraulic Fluids**

- Petroleum Base Oil ..... Use R&O (Rust and Oxidation inhibitor) type oils or anti-ware type oils (equivalent to ISO VG-32 & 46).
- Synthetic Fluids ..... Use Phosphate ester type fluids or polyol ester type fluids.
- Water Containing Fluids ..... Use water glycol type fluids or water in oil emulsion type fluids.
- Other Special Fluids ..... Consult factory for information.

**Recommended viscosity and Oil Temperatures**

Viscosity ranging between 15 and 400 cSt

Oil temperatures between - 15 and +70°C

Use hydraulic fluids which satisfy the recommended viscosity and oil temperature given above.

**Filtration Recommended ..... 25 microns or less.**

ST1004-※-1080

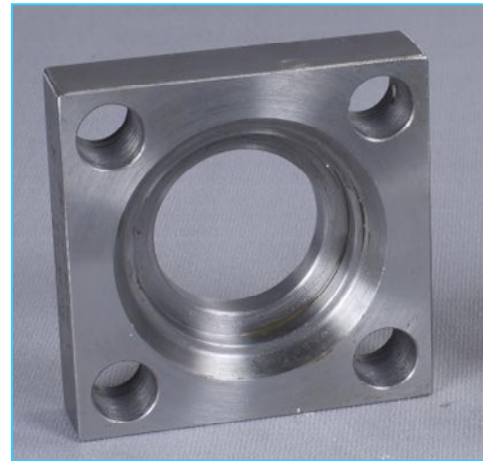
Model Numbers	“A” Thd.	Dimensions mm	
		B	C
ST-1004-※-1080	3/8 BSP.F	82	27

**DIMENSIONS IN MILLIMETRES**

■ **“F3” Series Pipe Flange Kits**

■ **Specifications**

- Max. Operating Pressure ..... 250 Kgf/cm<sup>2</sup>



■ **Model Number Designation**

F-	F3	-03W	B	N	-11	※
Material of Seal	Series Number	Flange Size	Type of Pipe Connection	O-Ring & Bolts	Design Number	Design * Standards
<b>None:</b> Standard NBR (Buna N) Seal  <b>F:</b> FPM (Viton) Seal (For Synthetic Fluids)	<b>F3</b>	<b>03W, 03, 06V</b> <b>06W, 06, 10W</b> <b>10, 16W, 16</b> <b>24W, 24</b>	<b>B:</b> Threaded Connection	<b>None:</b> With O-Ring and Mounting Bolts  <b>N:</b> No O-Ring and Mounting Bolts	<b>11</b>	<b>None:</b> Japanese Standard “JIS”  <b>80:</b> European Design Standard
		<b>03W, 03, 06V,</b> <b>06W,06, 10W,</b> <b>10,16W, 16,</b> <b>24W,24</b>	<b>A:</b> Pipe Socket Welding  <b>C:</b> Block Type			<b>80:</b> European Design Standard

\* Different design standard available as shown below. Select suitable design standard to your requirement.

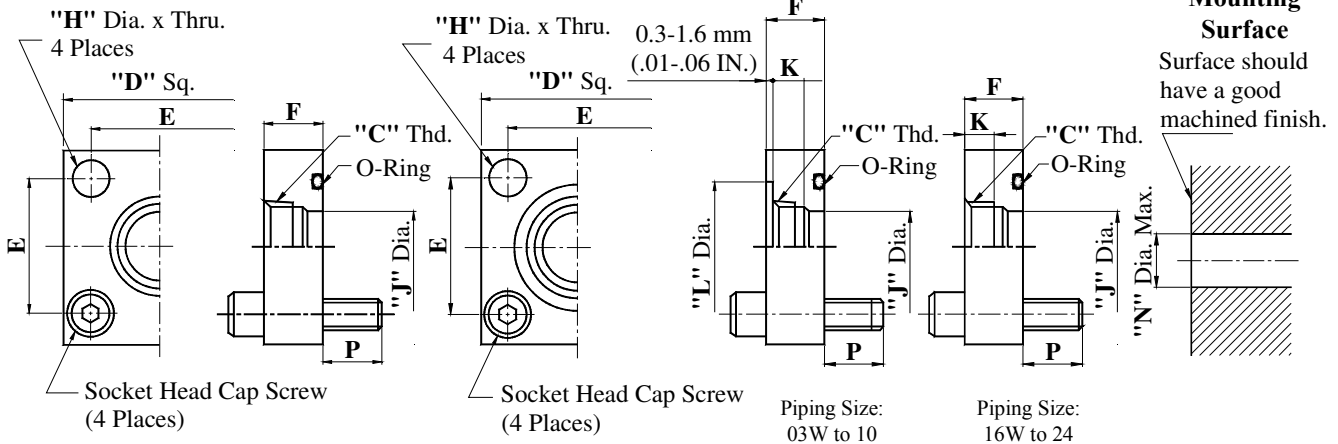
Type of Pipe Connection	Design Standard	Pipe Thread	Mounting Bolts (Socket Head Cap Screw)
For Threaded Connection	Japanese Standard “JIS”	Rc	Metric Thd.
	European Design Standard	BSP.F	Metric Thd.
	N. American Design Standard	NPT	Unified Thd.
For Pipe Socket Welding	Japanese Standard “JIS”	Rc	Metric Thd.

**Threaded Connection**

Japanese Standard "JIS" &  
N. American Design Standard  
F3-**B**-11/1190

European Design Standard  
F3-**B**-1180

**Customer's  
Mounting  
Surface**  
Surface should have a good  
machined finish.



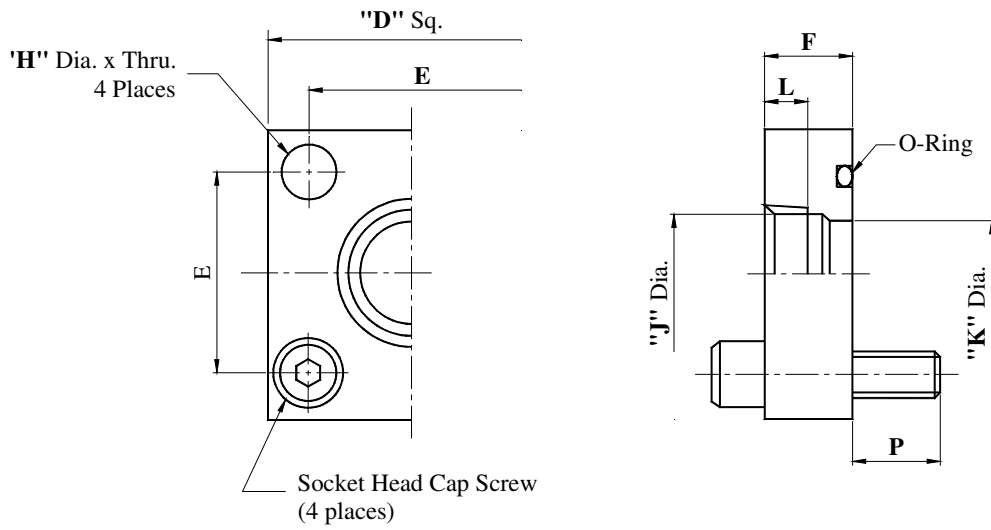
Kit Numbers	Piping Size "C" Thd.	Dimensions mm									O-Ring	Socket Head Cap Screw	Approx. Mass Kg.
		D	E	F	H	J	K	L	N	P			
F3-03W-B-11	Rc 1/4	54	36	21	11	11	--	--	15	14	SO-NB-G25	M10x35Lg.	0.5
F3-03W-B-1180	1/4 BSP.F					11.5	12	21					
F3-03W-B-1190	1/4 NPT					11	--	--					
F3-03-B-11	Rc 3/8					14	--	--					
F3-03-B-1180	3/8 BSP.F					15	14	24.3					
F3-03-B-1190	3/8 NPT					14	--	--					
F3-06V-B-11	Rc 3/8	58	40	21	11	14	--	--	20	14	SO-NB-G30	M10x35Lg.	0.8
F3-06W-B-11	Rc 1/2					17.5	--	--					
F3-06W-B-1180	1/2 BSP.F					19	17	29					
F3-06W-B-1190	1/2 NPT					17.5	--	--					
F3-06-B-11	Rc 3/4					23	--	--					
F3-06-B-1180	3/4 BSP.F					24.5	20	35.5					
F3-06-B-1190	3/4 NPT	23	--	--									
F3-10W-B-11	Rc 1	76	56	27	13.5	29	--	--	31.5	18	SO-NB-G40	M12x45Lg.	1.4
F3-10W-B-1180	1 BSP.F					30.5	21	43.5					
F3-10W-B-1190	1 NPT					29	--	--					
F3-10-B-11	Rc 1/4					--	--	--					
F3-10-B-1180	1-1/4 BSP.F					31.5	22	53					
F3-10-B-1190	1-1/4 NPT					--	--	--					
F3-16W-B-11	Rc 1 1/2	100	73	35	17.5	43.5	--	--	50	25	SO-NB-G60	M16x60Lg.	2.7
F3-16W-B-1180	1-1/2 BSP.F					45	22	--					
F3-16W-B-1190	1-1/2 NPT					43.5	--	--					
F3-16-B-11	Rc 2					--	--	--					
F3-16-B-1180	2 BSP.F					47.5	22	--					
F3-16-B-1190	2 NPT					--	--	--					
F3-24W-B-11	Rc 2-1/2	140	103	44	24	70	--	--	75	36	SO-NB-G85	M22x80Lg.	5.8
F3-24W-B-1180	2-1/2 BSP.F					72.5	20	--					
F3-24W-B-1190	2-1/2 NPT					70	--	--					
F3-24-B-11	Rc 3					--	--	--					
F3-24-B-1180	3 BSP.F					71	20	--					
F3-24-B-1190	3 NPT					--	--	--					

\* Approx. Mass is the value including socket Head Cap Screw (4 Places).

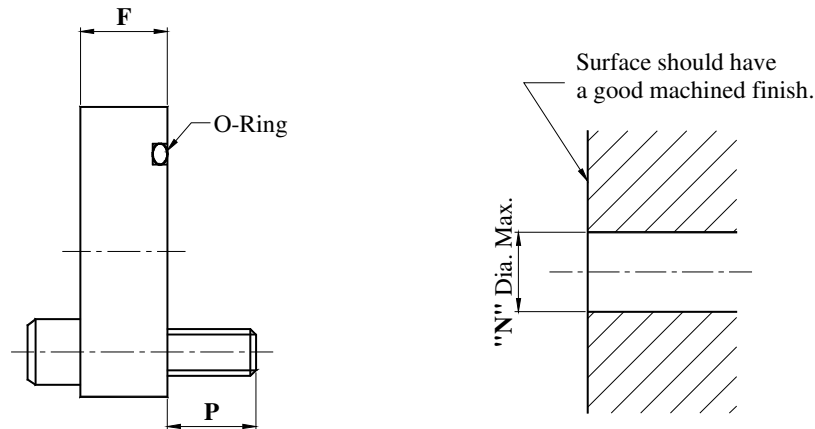


■ Pipe Socket Welding

F3-※-A※-11



F3-※-C※-11



Kit numbers	Piping Size	Dimensions mm									O-Ring	Socket Head Cap Screw	Approx.* Mass Kg.
		D	E	F	H	J	K	L	N	P			
F3-03W-※-11	1/4	54	36	21	11	14.3	11	8	15	14	SO-NB-G25	M10 x 35Lg.	0.5
F3-03-※-11	3/8					17.8	12.5	9		14			
F3-06V-※-11	3/8	58	40	21	11	17.8	12.5	9	20	14	SO-NB-G30	M10 x 35Lg.	0.8
F3-06W-※-11	1/2					22.2	16	11		14			
F3-06-※-11	3/4					27.7	20	12		14			
F3-10W-※-11	1	76	56	27	13.5	34.5	25	14	31.5	18	SO-NB-G40	M12 x 45Lg.	1.4
F3-10-※-11	1-1/4					43.2	31.5	16		18			
F3-16W-※-11	1-1/2	100	73	35	17.5	49.1	37.5	18	50	25	SO-NB-G60	M16 x 60Lg.	2.7
F3-16-※-11	2					61.1	47.5	20		25			
F3-24W-※-11	2-1/2	140	103	44	24	77.1	60	22	75	36	SO-NB-G85	M22 x 80Lg.	5.8
F3-24-※-11	3					90	71	25		36			

■ **“F5” Series Pipe Flange Kits**

This flange mounting surface measurements is based upon SAE 4 Bolt Spring Flange (Standard Pressure Series).

■ **Specifications**

- Max. Operating Pressure  
Maximum operating pressure varies with the type of pipe connection or flange size. Refer to the applicable installation drawing.



■ **Model Number Designation**

F-	F5	-06	-A	-10	※
Material of seal	Series Number	Flange Size	Type of Pipe Connection	Design Number	Design Standard *
<b>None:</b> Standard NBR (Buna N) Seal	<b>F5</b>	<b>04W, 04, 06X 16, 08, 10 24, 28, 32</b>	<b>A:</b> Threaded Connection	<b>10</b>	<b>None:</b> Japanese Standard "JIS"
		<b>04, 06, 08 10, 12, 16 20</b>		<b>11</b>	<b>80:</b> European Design Standard
		<b>04W, 04, 06 08, 10, 12 16, 20</b>		<b>10</b>	<b>90:</b> N. American Design Standard
<b>F:</b> FPM (Viton) Seal (For Synthetic Fluids)					

\* The three different design standard available as shown below. Select suitable design standard to your requirement.

Type of Pipe Connection	Design Standard	Pipe Thread	Mounting bolt (Socket Head Cap Screw)
Threaded Connection	Japanese Standard "JIS"	Rc	Metric Thd.
	European Design Standard	BSP.F	Metric Thd.
	N. American Design Standard	N P T	Unified Thd.

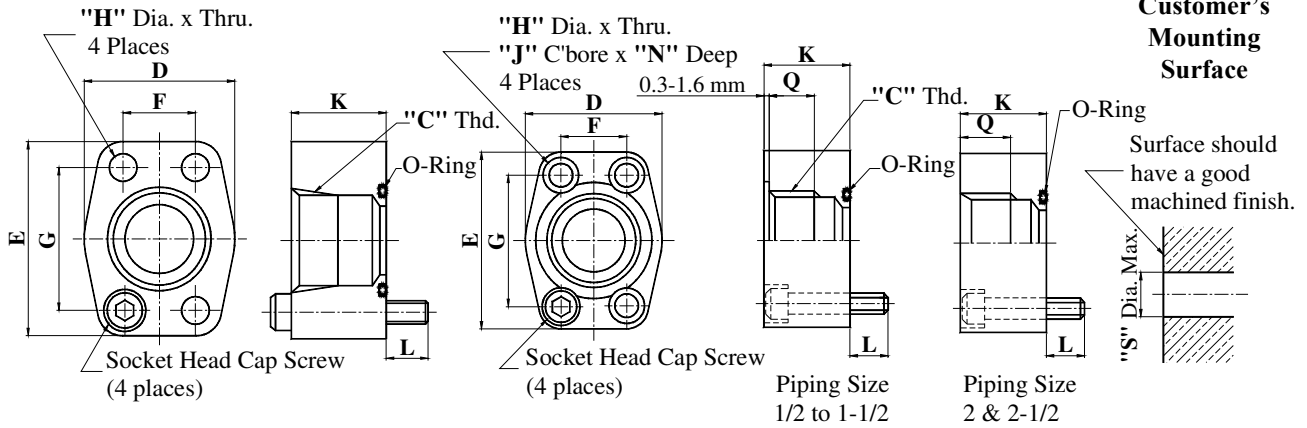
Threaded Connection

Japanese Standard "JIS" &  
N. American Design Standard

F5-~~※~~-A-10  
F5-~~※~~-A-1090

European Design Standard  
F5-~~※~~-A-1180

Customer's  
Mounting  
Surface



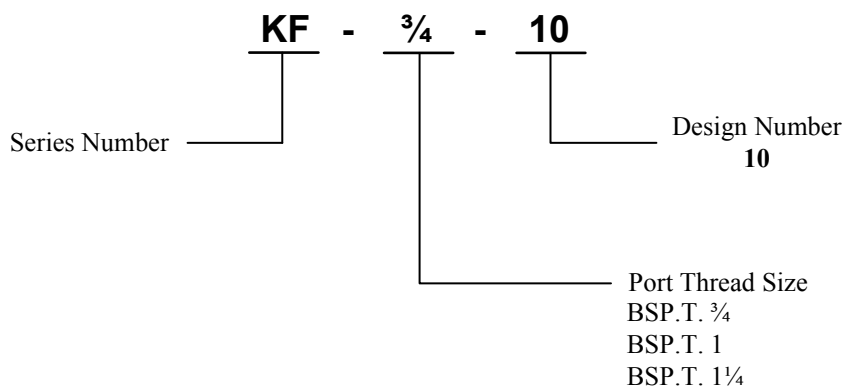
Kit numbers	Piping Size "C" Thd.	Dimensions mm											Socket Head Cap Screw (4 Places)	O-Ring	Max. Operating Pressure (Kg/cm <sup>2</sup> )	Approx. Mass Kg.				
		D	E	F	G	H	J	K	L	N	Q	S								
F5-04W-A-10	Rc 3/8											10			13	M8 x 40 Lg.	SO-NB-P22	280	0.5	
F5-04W-A-1090	3/8 NPT		54												15	5/16-18UNC x 1-3/4 Lg.				
F5-04-A-10	Rc 1/2	40	54	17.5	38.1	8.8						10			13	M8 x 40 Lg.	SO-NB-G30	280	0.7	
F5-04-A-1180	1/2 BSP.F		59						14	31	12.6	8.6	17	15	M8 x 35 Lg.					
F5-04-A-1090	1/2 NPT		54							30	14.5			13	5/16-18UNC x 1-3/4 Lg.					
F5-06X-A-10	Rc 3/4					8.8										M8 x 45 Lg.	SO-NB-G30	280	0.7	
F5-06-A10		48		22.2	47.6									19	M10 x 45 Lg.					
F5-06-A-1180	3/4 BSP.F		72					11	17.5	31	14.8	10.8	20		M10 x 35 Lg.					
F5-06-A-1090	3/4 NPT		65							30	14.5				3/8-16UNC x 1-3/4 Lg.					
F5-08-A-10	Rc 1		70												26	M10 x 45 Lg.	SO-NB-G35	280	0.9	
F5-08-A-1180	1 BSP.F	55	77	26.2	52.4	11			17.5	31	14.8	10.8	21	25	M10 x 35 Lg.					
F5-08-A-1090	1 NPT		70							30	14.5			26	3/8-16UNC x 1-3/4 Lg.					
F5-10-A-10	Rc 1-1/4		80													M10 x 55 Lg.	SO-NB-G40	218	1.2	
F5-10-A-1180	1-1/4 BSP.F	64	83	30.2	58.7	11			17.5	3	16.8	10.8	22	32	M10 x 45 Lg.					
F5-10-A-1090	1-1/4 NPT		80							38	19.2				7/16-14UNC x 2-1/4 Lg.					
F5-12-A10	Rc 1-1/2		94													M12 x 55 Lg.	SO-NB-G50	210	1.5	
F5-12-A-1180	1-1/2 BSP.F	72	99	35.7	69.9	13.5			21	41	17.5	13.5	22	38	M12 x 45 Lg.					
F5-12-A-1090	1-1/2 NPT		94							38	19.2				1/2-13UNC x 2-1/4 Lg.					
F5-16-A10	Rc 2		102													M12 x 55 Lg.	SO-NB-G65	175	1.7	
F5-16-A-1180	2 BSP.F	85	107	42.9	77.8	13.5			21	41	17.5	13.5	31	50	M12 x 45 Lg.					
F5-16-A-1090	2 NPT		102							38	19.2				1/2-13UNC x 2-1/4 Lg.					
F5-20-A-10	Rc 2-1/2		114													M12 x 65 Lg.	SO-NB-G75	175	1.9	
F5-20-A-1180	2-1/2 BSP.F	102	118	50.8	88.9	13.5			21	46	17.5	13.5	31	63	M12 x 50 Lg.					
F5-20-A-1090	2-1/2 NPT		114							48	21.8				1/2-13UNC x 2-3/4 Lg.					
F5-24-A-10	Rc 3		116	135	61.9	106.4										76	M16 x 70 Lg.	SO-NB-G85	35	2.7
F5-28-A-10	Rc 3-1/2		134	153	69.9	120.7	17.5	26	53	17					88	M16 x 70 Lg.				
F5-32-A-10	Rc 4		150	162	77.8	130.2										101	M16 x 70 Lg.	SO-NB-G115	3.7	

**Suction Pipe Flange for “A” Series Pumps**

These flanges are used for connecting the pump port to suction pipe. The advantages are easy mounting, compact size, cost effective, and reduced pressure drop.



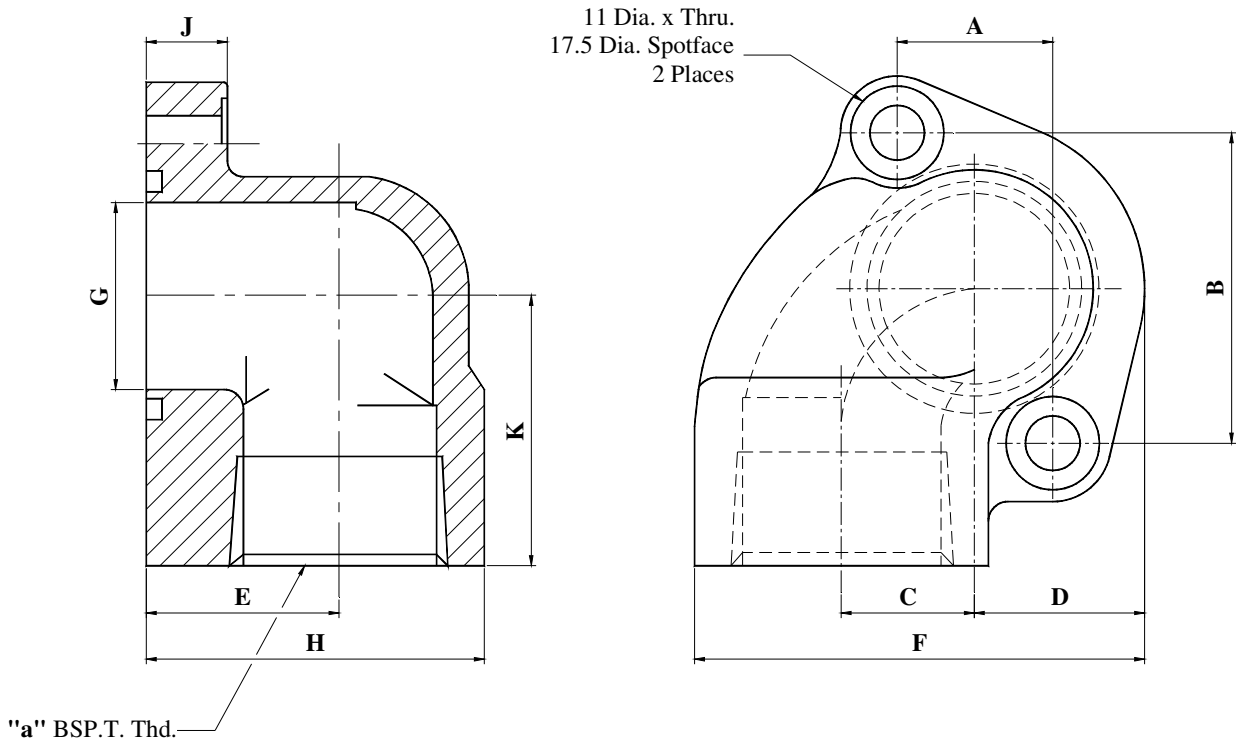
**1. Model Number Designation**



**2. Applicable Pump Model Numbers.**

Pump Model Number	Port Name	Pipe Flange Kit Model Number
AR16-FR※-※※	Suction	KF-3/4-10 (Standard)
AR22-FR01※-※※		KF-1-10 (Also available)
A37-F-R-01-※-K-※※		KF-1 1/4-10
A56-F-R-01-※-K-※※		

**3. Overall Dimensions**



Sl. No.	Suction Flange Model Number	Dimensions in mm										
		A	B	C	D	E	F	G	H	J	K	a
1	KF-3/4-10	22	48	23	26	30	81	22.5	60	16	45	3/4
2	KF-1-10											1
3	KF-1 1/4-10	30.2	58.7	25	32	37	84	36	65	15	52	1 1/4