TURBINE FLOWMETERS BY

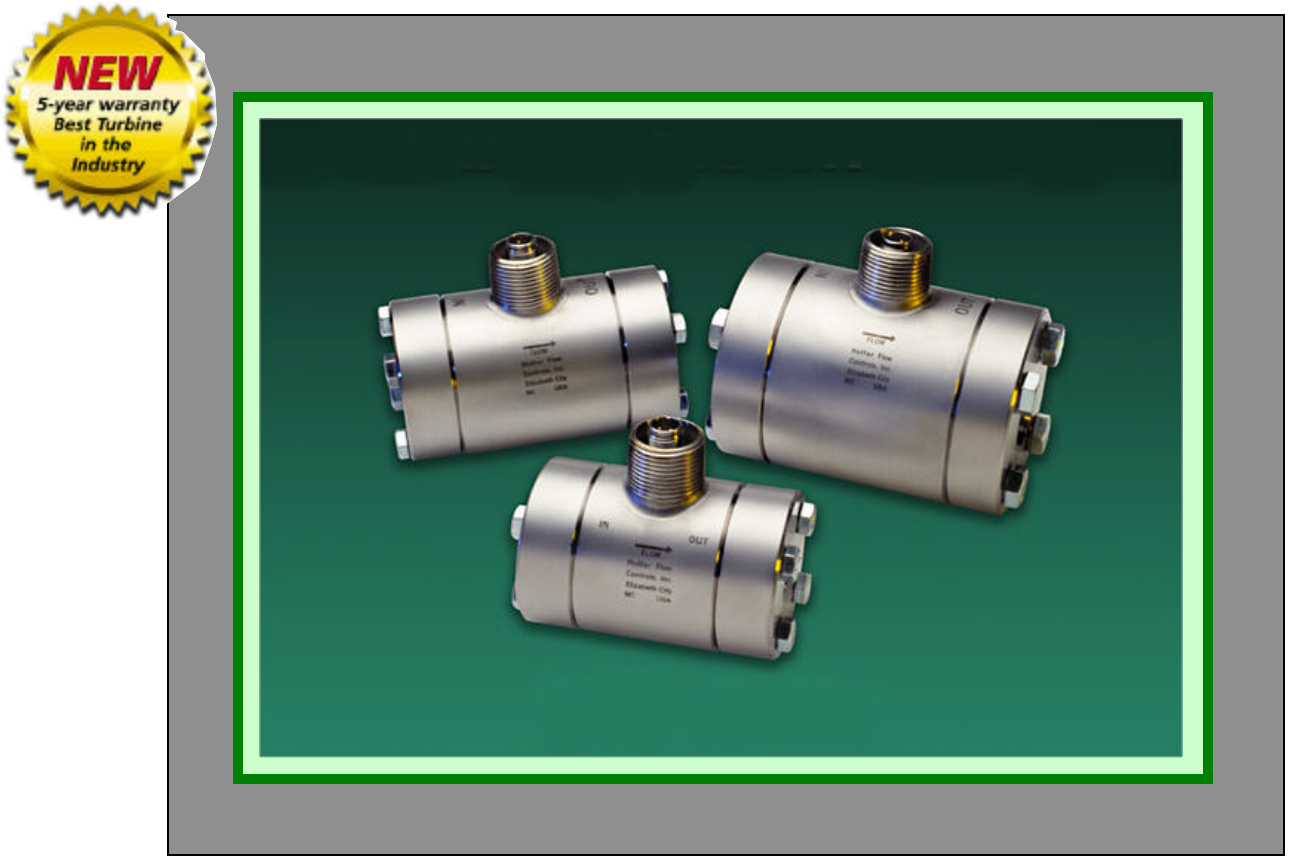
HOFFER

The Turbine Flowmeter Company

Product Bulletin HO-HHP-100G

HHP Series Turbine Flowmeters

TECHNICAL DATA SHEET



HHP SERIES

Hoffer High Pressure Turbine Flowmeters

OUTSTANDING FEATURES

- Low cost.
- Outstanding accuracy.
- Provides wide flow ranges (10:1 to 100:1 turndown ranges available).
- One piece 316/316L S/S Construction for most pressures.
- For use with unique Hoffer high pressure 316/316L or carbon steel mating flange kits, supplied complete with SAE J429 Grade 8 high yield strength bolts and "O" rings.
- Operate over a wide range of temperatures.
- Sizes 1/4" through 2". Pressure ratings of 3,000, 6,000, 8,000, and 10,000 psi available for most sizes.
- Larger sizes and pressures available upon request. Contact factory.

HOFFER HIGH PRESSURE TURBINE SERIES FOR LIQUID
(SIZES 1/4" THRU 2" WITH FOUR PRESSURE RATINGS OF 3,000 PSIG, 6,000 PSIG, 8,000 PSIG AND 10,000 PSIG)

SPECIFICATIONS

Overrange: 150% of maximum flow (intermittently).

Linearity:

±0.5% of reading (±0.25% typical) over tabulated linear flow range.

Repeatability:

±0.1% (±0.05% typical) over tabulated repeatable range.

Pressure Drop Characteristics: 4 to 5 PSI at maximum linear flow rate at one CSTK.

Available Turn Down Range: 10:1 to 100:1.

Available Temperature Range: -40°F to +350°F Standard. Temperature ratings are dependent on o-ring materials used. Consult factory for extended temperature range applications.

Bearing Styles: Ceramic hybrid ball bearings, sleeve bearings in tungsten carbide and hard carbon composite are available.

Materials: 316 stainless steel standard. Consult with applications group for corrosive applications. Broad material list available.

LIQUID SIZE SELECTOR CHART FOR HHP SERIES TURBINE FLOWMETERS

Flowmeter Size	MAGNETIC PICKUP COIL				MODULATED PICKUP COIL			
Diameter (inches)	Linear Range (US GPM)	Linear Range (LPM)	Repeatable Range (US GPM)	Repeatable Range (LPM)	Linear Range (US GPM)	Linear Range (LPM)	Repeatable Range (US GPM)	Repeatable Range (LPM)
HHP 1/2 X 1/4*	.35-3.5	1.3-13.2	.25-4.5	.95-17	.35-3.5	1.3-13.2	.0625-4.5	.24-17
HHP 1/2 X 3/8*	.75-7.5	2.8-28.4	.3-9	1.1-34	.75-7.5	2.8-28.4	.075-9	.28-34
HHP 1/2 X 1/2	1.25-9.5	4.7-36	.6-12	2.3-45	1.25-9.5	4.7-36	.12-12	.45-45
HHP 3/4 X 5/8	1.75-16	6.6-60.6	.9-20	3.4-75.7	1.75-16	6.6-60.6	.2-20	.75-75.7
HHP 3/4 X 3/4	2.5-29	9.5-110	1.5-35	5.7-132.5	2.5-29	9.5-110	.35-35	1.3-132.5
HHP 1 X 1	4-60	15-227	2-75	7.6-284	4-60	15-227	.75-75	2.8-284
HHP 1 1/4 X 1 1/4	6-93	23-352	3-115	11.4-435	6-93	23-352	1.15-115	4.35-435
HHP 1 1/2 X 1 1/2	8-130	30.3-492	5-175	19-662	8-130	30.3-492	1.75-175	6.6-662
HHP 2 X 2	15-225	56.8-852	11-275	42-1041	15-225	56.8-852	2.75-275	10.4-1041

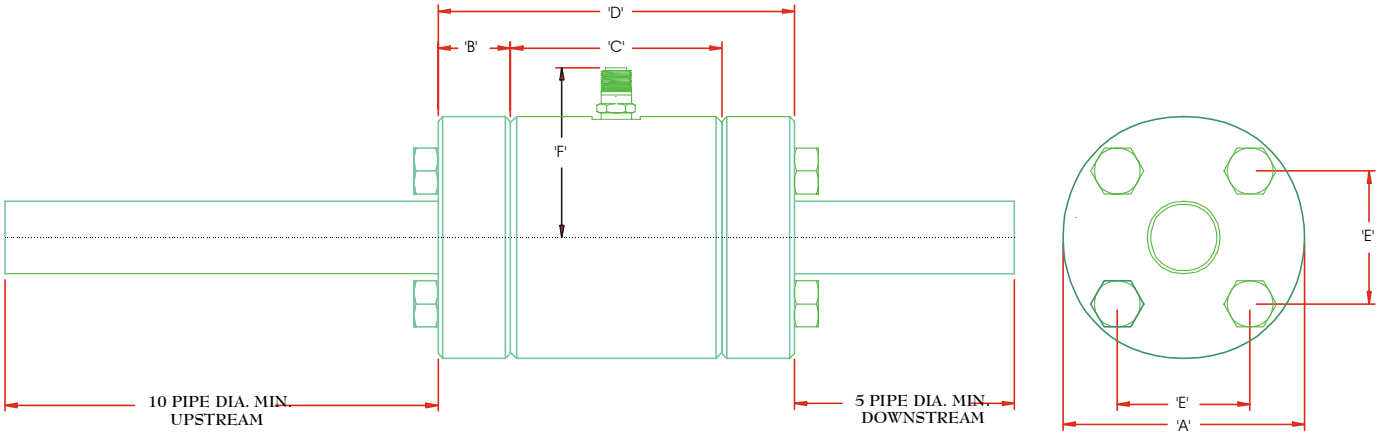
NOTE: Performance enhancement techniques are routinely applied to produce larger linear and usable flow ranges. Consult with the applications group at Hoffer with your requirements.
* The linear flow ranges on 1/4" and 3/8" may be derated depending on bearing selection. Consult applications group for additional information.

GAS APPLICATIONS FOR HHP SERIES TURBINE FLOWMETERS
Consult factory for gas applications/sizing.

TYPICAL HHP SERIES APPLICATIONS:
- *SUBSEA*
- *HYDRAULICS*

OTHER HIGH PRESSURE METERS OFFERED BY HOFFER:
- *WING NUT SERIES*
- *INSERTION AH SERIES*

DIMENSIONAL INFORMATION



Dimensional and Bolt Information for the HHP Series									
Flowmeter Size	'A'	'B'	'C'	'D'	'E'	'F'	O'RING	BOLTS	BOLT TORQUE FT-LB
HHP 1/2 X 1/4, 1/2 X 3/8, 1/2 X 1/2									
3000	3.00	1.00	3.50	5.50	1.437	2.65	-212	3/8-16 X 1.75	22 FT-LB
6000	3.00	1.00	3.50	5.50	1.437	2.65	-212	3/8-16 X 1.75	22 FT-LB
8000	4.25	1.75	3.50	7.00	2.25	3.28	-212	1/2-13 X 2.75	56 FT-LB
10000	4.25	1.75	3.50	7.00	2.25	3.28	-212	1/2-13 X 2.75	56 FT-LB
HHP 3/4 X 5/8 AND 3/4 X 3/4									
3000	3.00	1.00	3.50	5.50	1.438	2.65	-214	3/8-16 x 1.75	22 FT-LB
6000	3.20	1.00	3.50	5.50	1.75	2.75	-214	3/8-16 x 1.75	22 FT-LB
8000	4.00	1.38	3.50	6.25	2.50	3.15	-214	1/2-13 x 2.50	56 FT-LB
10000	5.00	1.75	3.50	7.00	2.12	3.65	-214	5/8-11 x 3.00	91 FT-LB
HHP 1 X 1									
3000	4.00	1.00	3.50	5.50	2.00	3.15	-219	1/2-13 x 2.00	56 FT-LB
6000	4.00	1.00	3.50	5.50	2.00	3.15	-219	1/2-13 x 2.00	56 FT-LB
8000	4.50	1.38	3.50	6.25	2.30	3.40	-219	5/8-11 x 2.50	91 FT-LB
10000	5.20	2.00	3.50	7.50	2.75	3.75	-219	3/4-10 x 3.25	153 FT-LB
HHP 1-1/4 X 1-1/4									
3000	4.00	1.00	3.87	5.87	2.00	3.15	-222	1/2-13 X 2.00	56 FT-LB
6000	5.20	1.25	3.87	6.37	2.75	3.75	-222	5/8-11 X 2.50	91 FT-LB
8000	5.20	1.62	3.87	7.11	2.65	3.75	-222	5/8-11 X 2.75	91 FT-LB
10000	6.50	2.25	3.87	8.37	3.50	4.40	-222	7/8-9 X 3.50	248 FT-LB
HHP 1-1/2 X 1-1/2									
3000	5.00	1.25	4.38	6.88	2.75	3.65	-223	5/8-11 X 2.50	91 FT-LB
6000	5.00	1.50	4.38	7.38	2.75	3.65	-223	5/8-11 X 2.50	91 FT-LB
8000	6.20	1.88	4.38	8.14	3.40	4.25	-223	3/4-10 X 3.00	153 FT-LB
HHP 2 X 2									
3000	5.00	1.25	4.75	7.25	2.75	3.65	-226	5/8-11 X 2.25	91 FT-LB
6000	6.20	1.75	4.75	8.25	3.50	4.25	-226	3/4-10 X 3.00	153 FT-LB

HHP TURBINE FLOWMETER MODEL NUMBERING SYSTEM

MODEL **HHP (A) X (B)- (C)- (D)- (E)- (F/G/H)- (I) - (J)- (K)**

PROCESS CONNECTION / END FITTING SIZE
TURBINE FLOWMETER SIZE
MINIMUM FLOW RATE IN GPM
MAXIMUM FLOW RATE IN GPM
BEARING TYPE
PICKUP COILS
COIL SPACING, MECHANICAL DEGREES
RISER AND EXPLOSION PROOF COIL ENCLOSURES
PROCESS CONNECTION/END FITTING TYPE
FLANGE KITS
SPECIAL FEATURES

NOTE: WHEN ORDERING, THE CUSTOMER'S PROCESS PIPE SCHEDULE AND SIZE NEEDS TO BE INDICATED.

PROCESS CONNECTION/END FITTING SIZE & TURBINE FLOWMETER SIZE

MODEL **HHP(A)X(B)-(__)-(__)-(__)-(__/__/__)-(__)-(__)-(__)**

HHP 1/2 X 1/4
HHP 1/2 X 3/8
HHP 1/2 X 1/2
HHP 3/4 X 5/8
HHP 3/4 X 3/4
HHP 1 X 1
HHP 11/4 X 11/4

THE FLANGES FOR THESE SIZES WITH **3000#, 6000#, 8000#, & 10,000#** PRESSURES ARE PART OF A ONE PIECE HOUSING CONSTRUCTION .

HHP 11/2 X11/2 *
HHP 2 X 2 **

* THE FLANGES FOR THE 11/2" SIZE WITH **3000#, 6000#, & 8000#** PRESSURES ARE PART OF A ONE PIECE HOUSING CONSTRUCTION. THE FLANGES FOR THE 11/2" SIZE WITH **10,000#** PRESSURE ARE WELDED TO THE HOUSING BODY.

** THE FLANGES FOR THE 2" SIZE WITH **3000# & 6000#** PRESSURES ARE PART OF A ONE PIECE HOUSING CONSTRUCTION. THE FLANGES FOR THE 2" SIZE WITH **8000# & 10,000#** PRESSURES ARE WELDED TO THE HOUSING BODY.

HHP 21/2 X21/2
HHP 3 X 3
HHP 4 X

THE FLANGES FOR THESE SIZES ARE WELDED TO THE HOUSING BODY.

MINIMUM FLOW AND MAXIMUM FLOW RATE IN GPM

MODEL **HHP(__)X(__)-(C)-(D)-(__)-(__/__/__)-(__)-(__)-(__)**

NOTE: FOR EXTENDED RANGES REFER TO SIZE SELECTOR CHARTS.

TURBINE SIZE	**(C) MINIMUM FLOW**	TO	**(D) MAXIMUM FLOW**
1/4	.35 GPM		3.5 GPM
3/8	.75 GPM		7.5 GPM
1/2	1.25 GPM		9.5 GPM
5/8	1.75 GPM		16 GPM
3/4	2.5 GPM		29 GPM
1	4 GPM		60 GPM
11/4	6 GPM		93 GPM
11/2	8 GPM		130 GPM
2	15 GPM		225 GPM
21/2	25 GPM		400 GPM
3	40 GPM		650 GPM
4	75 GPM		1250 GPM

BEARING TYPE

MODEL **HHP(__)X(__)-(__)-(__)-(E)-(__/__/__)-(__)-(__)-(__)**

OPTION **(E)**

1/4" THRU 1" TURBINE SIZES
(CB) CERAMIC HYBRID BALL BEARING, SELF LUBRICATING
(C) HARD CARBON COMPOSITE SLEEVE BEARING
(T) TUNGSTEN CARBIDE SLEEVE BEARING

1 1/4" THRU 1 1/2" TURBINE SIZES
(CB) CERAMIC HYBRID BALL BEARING, SELF LUBRICATING
(C) HARD CARBON COMPOSITE SLEEVE BEARING
(T) TUNGSTEN CARBIDE SLEEVE BEARING

2" TURBINE SIZES
(CB) CERAMIC HYBRID BALL BEARING, SELF LUBRICATING
(C) HARD CARBON COMPOSITE SLEEVE BEARING
(T) TUNGSTEN CARBIDE SLEEVE BEARING

2 1/2" TURBINE SIZES
(CB) CERAMIC HYBRID BALL BEARING, SELF LUBRICATING
(C) HARD CARBON COMPOSITE SLEEVE BEARING
(T) TUNGSTEN CARBIDE SLEEVE BEARING

3" TURBINE SIZES
(CB) CERAMIC HYBRID BALL BEARING, SELF LUBRICATING
(C) HARD CARBON COMPOSITE SLEEVE BEARING
(T) TUNGSTEN CARBIDE SLEEVE BEARING

4" TURBINE SIZES
(CB) CERAMIC HYBRID BALL BEARING, SELF LUBRICATING
(C) HARD CARBON COMPOSITE SLEEVE BEARING
(T) TUNGSTEN CARBIDE SLEEVE BEARING

OPTIONAL ACCESSORIES

HIT-2A Rate Indicator / Totalizer (Refer to Technical Data Sheet HIT-2A-107)

Nova-Flow Computer (Refer to Technical Data Sheet NF-102)

PICKUP COILS

MODEL **HHP(__)X(__)-(__)-(__)-(__)-(F / /)-(__)-(__)-(__)**

OPTION **(F)**

(1M)	ONE MAG COIL	(1RPMXXX)	ONE REDI-PULSE MAG COIL **(SEE REDI-PULSE AND I.S. REDI-PULSE DATA SHEETS TO COMPLETE REDI-PULSE PART NUMBERS)**
(2M)	TWO MAG COILS		
(1MC3PA)	ONE RF COIL	(2RPMXXX)	TWO REDI-PULSE MAG COILS
(2MC3PA)	TWO RF COILS	(1RPRXXX)	ONE REDI-PULSE RF COIL
(1MC2PAHT)	ONE HIGH TEMP 6" PIGAIL RF COIL	(2RPRXXX)	TWO REDI-PULSE RF COILS
(2MC2PAHT)	TWO HIGH TEMP 6" PIGTAIL RF COILS	(1DMXXXX)	ONE REDI-PULSE INTRINSICALLY SAFE MAG COIL
(1HTM)	HIGH TEMP MAG COIL	(2DMXXXX)	TWO REDI-PULSE INTRINSICALLY SAFE MAG COILS
(2HTM)	TWO HIGH TEMP MAG COILS	(1DRXXXX)	ONE REDI-PULSE INTRINSICALLY SAFE RF COIL
(1ISM)	ONE INTRINSICALLY SAFE MAG COIL	(2DRXXXX)	TWO REDI-PULSE INTRINSICALLY SAFE RF COILS
(2ISM)	TWO INTRINSICALLY SAFE MAG COILS	(-P*)	PIGTAIL OR FLYING LEADS, ADD -P AND THE *LENGTH OF LEADS AFTER ANY COIL EXCEPT THE HIGH TEMPERATURE COILS.

COIL SPACING, MECHANICAL DEGREES

MODEL **HHP(__)X(__)-(__)-(__)-(__)-(/ G /)-(__)-(__)-(__)**

NOTE **(G)**: 90 DEGREE ELECTRICAL COIL SPACING FOR TWO COILS REQUIRE THE FOLLOWING MECHANICAL SPACING:

TURBINE SIZE	FORWARD MECH. DEGREES	REVERSE DEGREES MECH. DEGREES	COIL SPARE DEGREES
1/4"	ZERO		
3/8"	ZERO		
1/2"	ZERO	**Sizes 1/4" through 1", consult factory for spacing.**	
5/8"	ZERO		
3/4"	ZERO		
1"	ZERO		
11/4"	ZERO	75 or 105	250
11/2"	ZERO	75 or 105	250
2"	ZERO	101.25	250

RISER AND EXPLOSION PROOF COIL ENCLOSURES

MODEL **HHP(__)X(__)-(__)-(__)-(__)-(/ / H)-(__)-(__)-(__)**
OPTION **(H)**

(X)	1" MNPT RISER, WELDED TO BODY, REQUIRED FOR ALL TYPE OF ENCLOSURES.
(X3/O)	1" RISER WITH ENCLOSURE WITHOUT ANY SIGNAL CONDITIONER.
(X3H/O)	1" RISER WITH ENCLOSURE AND DOME COVER FOR STYLE 1 SIGNAL CONDITIONER.
(X3B/O)	SAME AS (X3/O) WITH BASEEFA, FM AND CENELEC-EExd APPROVALS.
(X4H/O)	1" RISER WITH DOME COVER FOR ACC22 AND ACC96.
(3B/O)	1" RISER WITH DOME COVER FOR STYLE 1 SIGNAL CONDITIONERS TO MEET GROUP B.
(3B/O-ATEX)	1" RISER WITH DOME COVER FOR STYLE 1 SIGNAL CONDITIONERS TO MEET GROUP B. Meets ATEX.
(4/O)	1" RISER WITH FLAT COVER FOR STYLE 2 SIGNAL CONDITIONER TO MEET GROUPS C & D.
(4B/O)	1" RISER WITH DOME COVER FOR STYLE 2 SIGNAL CONDITIONERS TO MEET GROUP B.
(-X8S)	ADD 8S AFTER X RISER FOR A 8" LONG S/S RISER FOR HOT AND COLD MEDIA APPLICATIONS.

PROCESS CONNECTION/END FITTING TYPE

MODEL **HHP(__)X(__)-(__)-(__)-(__)-(/ /)-(I)-(__)-(__)**
OPTION **(I)**

1/2-HHP3,000-SS 1/2-HHP6,000-SS 1/2-HHP8,000-SS 1/2-HHP10,000-SS	1-HHP3,000-SS 1-HHP6,000-SS 1-HHP8,000-SS 1-HHP10,000-SS	11/2 -HHP3,000-SS 11/2 -HHP6,000-SS 11/2 -HHP8,000-SS
3/4-HHP3,000-SS 3/4-HHP6,000-SS 3/4-HHP8,000-SS 3/4-HHP10,000-SS	11/4 -HHP3,000-SS 11/4 -HHP6,000-SS 11/4 -HHP8,000-SS 11/4 -HHP10,000-SS	2-HHP3,000-SS 2-HHP6,000-SS

NOTE:THE FLANGES FOR THE FOLLOWING SIZES ARE WELDED TO THE HOUSING BODY AND CAN BE CARBON STEEL OR 316 S/S.

11/2 -HHP10,000-SS	2-HHP8,000-SS 2-HHP10,000-SS
11/2 -HHP3,000-CS 11/2HHP6,000-CS 11/2 -HHP8,000-CS 11/2 -HHP-10,000-CS	2-HHP3,000-CS 2-HHP6,000-CS 2-HHP8,000-CS 2-HHP10,000-CS

FLANGE KITS

MODEL **HHP(__)X(__)-(__)-(__)-(__)-(__/__/__)-(__)-(J)-(__)**

OPTION **(J)**
NOTE: ALL SIZES MUST USE THE HOFFER FLANGE KITS WHICH ARE UNIQUE TO THE HOUSING BODY. ALL SIZES CAN BE EITHER CARBON STEEL OR 316 S/S.
EACH KIT CONSISTS OF:
2 EA. SOCKET WELD FLANGES , 2 EA. VITON 'O' RINGS, 1 SET BOLTS AND WASHERS (REFER TO DIMENSIONAL INFORMATION)

OPTION **(J)**	
1/2"-FK3000-SS	3,000# MATING FLANGE HHP KIT 316 S/S
1/2"-FK3000-CS	3,000# MATING FLANGE HHP KIT C/S
1/2"-FK6000-SS	6,000# MATING FLANGE HHP KIT 316 S/S
1/2"-FK6000-CS	6,000# MATING FLANGE HHP KIT C/S
1/2"-FK8000-SS	8,000# MATING FLANGE HHP KIT 316 S/S
1/2"-FK8000-CS	8,000# MATING FLANGE HHP KIT C/S
1/2"-FK10,000-SS	10,000# MATING FLANGE HHP KIT 316 S/S
1/2"-FK10,000-CS	10,000# MATING FLANGE HHP KIT C/S
3/4"-FK3000-SS	3,000# MATING FLANGE HHP KIT 316 S/S
3/4"-FK3000-CS	3,000# MATING FLANGE HHP KIT C/S
3/4"-FK6000-SS	6,000# MATING FLANGE HHP KIT 316 S/S
3/4"-FK6000-CS	6,000# MATING FLANGE HHP KIT C/S
3/4"-FK8000-SS	8,000# MATING FLANGE HHP KIT 316 S/S
3/4"-FK8000-CS	8,000# MATING FLANGE HHP KIT C/S
3/4"-FK10,000-SS	10,000# MATING FLANGE HHP KIT 316 S/S
3/4"-FK10,000-CS	10,000# MATING FLANGE HHP KIT C/S
1"-FK3000-SS	3,000# MATING FLANGE HHP KIT 316 S/S
1"-FK3000-CS	3,000# MATING FLANGE HHP KIT C/S
1"-FK6000-SS	6,000# MATING FLANGE HHP KIT 316 S/S
1"-FK6000-CS	6,000# MATING FLANGE HHP KIT C/S
1"-FK8000-SS	8,000# MATING FLANGE HHP KIT 316 S/S
1"-FK8000-CS	8,000# MATING FLANGE HHP KIT C/S
1"-FK10,000-SS	10,000# MATING FLANGE HHP KIT 316 S/S
1"-FK10,000-CS	10,000# MATING FLANGE HHP KIT C/S
11/4"-FK3000-SS	3,000# MATING FLANGE HHP KIT 316 S/S
11/4"-FK3000-CS	3,000# MATING FLANGE HHP KIT C/S
11/4"-FK6000-SS	6,000# MATING FLANGE HHP KIT 316 S/S
11/4"-FK6000-CS	6,000# MATING FLANGE HHP KIT C/S
11/4"-FK8000-SS	8,000# MATING FLANGE HHP KIT 316 S/S
11/4"-FK8000-CS	8,000# MATING FLANGE HHP KIT C/S
11/4"-FK10,000-SS	10,000# MATING FLANGE HHP KIT 316 S/S
11/4"-FK10,000-CS	10,000# MATING FLANGE HHP KIT C/S
11/2"-FK3000-SS	3,000# MATING FLANGE HHP KIT 316 S/S
11/2"-FK3000-CS	3,000# MATING FLANGE HHP KIT C/S
11/2"-FK6000-SS	6,000# MATING FLANGE HHP KIT 316 S/S
11/2"-FK6000-CS	6,000# MATING FLANGE HHP KIT C/S

OPTION **(J)**	
11/2"-FK8000-SS	8,000# MATING FLANGE HHP KIT 316 S/S
11/2"-FK8000-CS	8,000# MATING FLANGE HHP KIT C/S
11/2"-FK10,000-SS	10,000# MATING FLANGE HHP KIT 316 S/S
11/2"-FK10,000-CS	10,000# MATING FLANGE HHP KIT C/S
2"-FK3000-SS	3,000# MATING FLANGE HHP KIT 316 S/S
2"-FK3000-CS	3,000# MATING FLANGE HHP KIT C/S
2"-FK6000-SS	6,000# MATING FLANGE HHP KIT 316 S/S
2"-FK6000-CS	6,000# MATING FLANGE HHP KIT C/S
2"-FK8000-SS	8,000# MATING FLANGE HHP KIT 316 S/S
2"-FK8000-CS	8,000# MATING FLANGE HHP KIT C/S
2"-FK10,000-SS	10,000# MATING FLANGE HHP KIT 316 S/S
2"-FK10,000-CS	10,000# MATING FLANGE HHP KIT C/S

SPECIAL FEATURES

MODEL **HHP(__)X(__)-(__)-(__)-(__)-(__/__/__)-(__)-(__)-(K)**

OPTIONS **(K)**
(CE) CE MARK - REQUIRED FOR EUROPE
(PED-CE) PED MARK - REQUIRED FOR EUROPE
(SP) ANY SPECIAL FEATURES THAT ARE NOT COVERED IN THE MODEL NUMBER, USE A WRITTEN DESCRIPTION OF THE -SP.

HOFFER FLOW CONTROLS, INC.
107 Kitty Hawk Lane, P. O. Box 2145, Elizabeth City, NC 27906-2145
800-628-4584 252-331-1997 FAX 252-331-2886
www.hofferflow.com email: info@hofferflow.com

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specification are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

The quality system covering the design, manufacture and testing of our products is certified to International Standard ISO 9001.

ISO9001
Registered Company