

# FE / EXTERNAL SEALING CONNECTION TOOL

Pneumatic sealing connection tool for external sealing in automated and semi-automated processes.

## CONNECTS TO:



## SPECIFICATIONS

Pressure Rating	Pilot Pressure	Operating Temperatures**
Vacuum to 500 psi (34 bar)	60 psi (4.1 bar)	0°F to +200°F (-17°C to +93°C)
Termination Port	Materials of Construction	Seal Material*
Female 10-32 UNF, M5X8, NPT/BSPP (G): 1/8 to 2 1/2	Anodized Aluminum, Stainless Steel, Potted PCA	Standard: Neoprene, Urethane Optional: FKM, Buna-N, EPDM, FDA White Neoprene

\* Additional seal material types available, consult factory.  
\*\* Operating Temp: 32°F-100°F (0°C-38°C) for ICON™.

- i** Sealing Connection Tool and test part should be rigidly fixtured to prevent separation when under pressure (fixture not required for vacuum applications).

## ACTUATION METHOD

**Pneumatic:** Pilot pressure applied to seals with no metal contact and uniform seal movement seals inside tubes and pipes with no marring.

## ICON™ TECHNOLOGY

SURE SEAL™

SEAL LIFE™

ACCESSORIES FOR DETAILS, SEE PG. 64



Pilot Booster

- 1** Automated processes and high volume production testing including pick-and-place and delicate robotic handling applications
- 2** Capable of sealing conventional and unique sealing surfaces including threads with the addition of a pilot booster (see page p. 64)  
Quick change seal sets to accommodate multiple sizes of tubing and easy field maintenance - use neoprene for standard sealing, use urethane for maximum abrasion resistance / high pressure and duty cycle applications
- 3**



# ICON™

## INTELLIGENT CONNECTION TECHNOLOGY

FasTest's ICON™ adds sensing capabilities to our mechanical Sealing Connection Tools. ICON™ Tools include instant LED visual feedback and data output to improve sealing connection accuracy, maximize production efficiency, and optimize maintenance.



### ICON™ features:



#### SURE SEAL™

Instant LED feedback verifies a good connection prior to starting a test.



#### SEAL LIFE™

Alert when the main seal is at end of life and must be replaced.

### System Overview:

CONNECTED

Green indication of a good connection.

RECONNECT

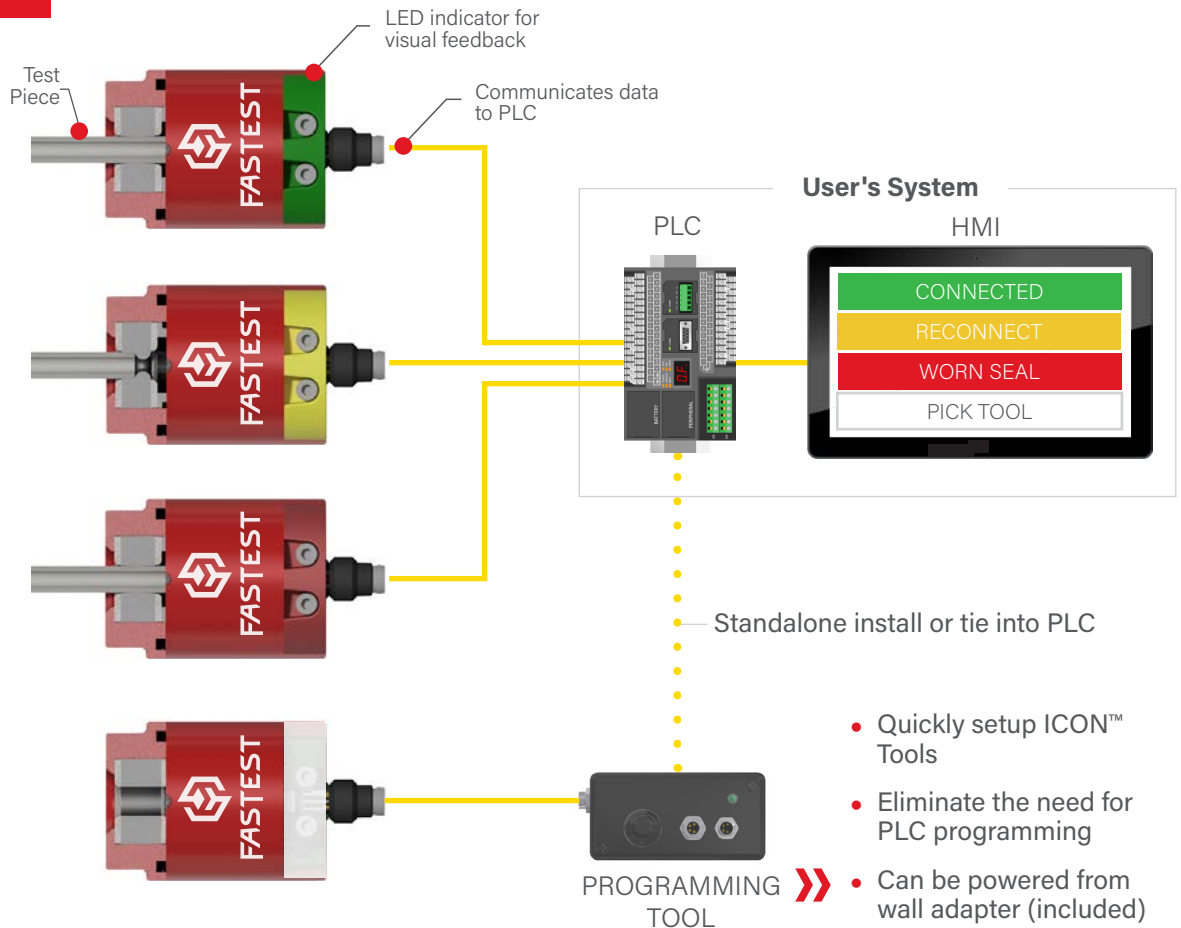
Recognize a connection issue before causing a false failure.

WORN SEAL

Alert when main seals should be replaced.

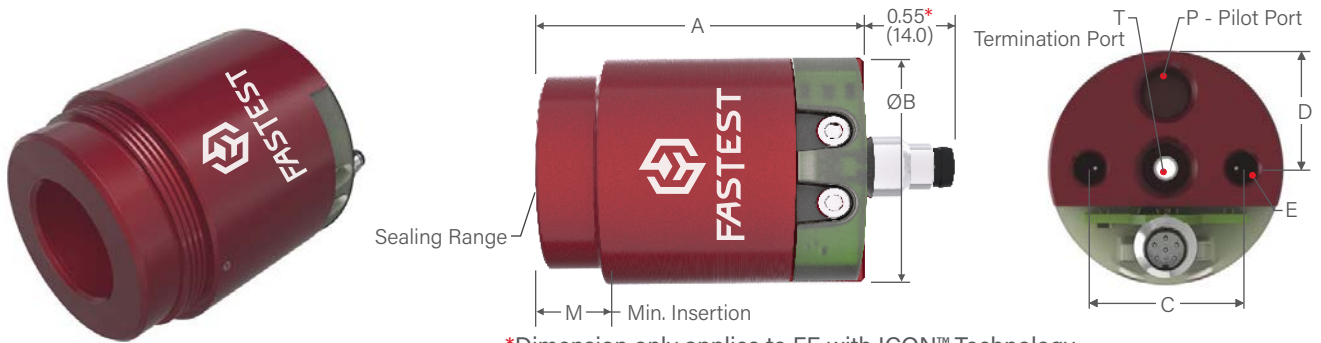
PICK TOOL

Controllable LED signals operator to use specific tool.



- Quickly setup ICON™ Tools
- Eliminate the need for PLC programming
- Can be powered from wall adapter (included) or from a PLC (24VDC)

# FE / EXTERNAL SEALING CONNECTION TOOL / STRAIGHT TUBES & BORES



\*Dimension only applies to FE with ICON™ Technology (Base Part Numbers that include "CV04ANA" or "CV04SSR").

Ordering Information (Complete Connector = Main Seal Set + Base Part Number)					Dimensions							
Sealing Range	Main Seal Set*	Base Part Number	Replacement Seals Pack (5)**	Rebuild Kit	A	B	C	D	E	M	P	T

FE | Connectors for Straight Tubes

0.030 to 0.050		FE0010050	FEB0010050	FER001	1.72 (43.7)	0.84 (21.3)	0.63 (16.0)	N/A	4-40 UNC	0.16 (4.1)	10-32 UNF	1/8 NPT
0.050 to 0.080		FE001001	FEB001001									
0.080 to 0.130		FE001002	FEB001002									
0.100 to 0.180	FES0101	FE01 FE01CV04ANA FE01CV04SSR	FEB0101	FER01 FER01CV04ANA FER01CV04SSR	2.05 (52.1)	1.49 (37.8)	1.10 (27.9)	0.55 (14.0)	10-32 UNF	0.58 (14.7)	10-32 UNF	1/8 NPT
0.180 to 0.260	FES0102		FEB0102									
0.260 to 0.340	FES0103		FEB0103									
0.340 to 0.420	FES0104		FEB0104									
0.420 to 0.510	FES0105		FEB0105									
0.433 to 0.512	FES115	FE1 FE1CV04ANA FE1CV04SSR	FEB115	FER1 FER1CV04ANA FER1CV04SSR	2.72 (69.1)	2.22 (56.4)	1.62 (41.1)	0.81 (20.6)	1/4-28 UNF	0.61 (15.5)	1/8 NPT	1/4 NPT
0.512 to 0.591	FES116		FEB116									
0.591 to 0.669	FES117		FEB117									
0.669 to 0.750	FES118		FEB118									
0.750 to 0.827	FES119		FEB119									
0.787 to 0.866	FES221	FE2 FE2CV04ANA FE2CV04SSR	FEB221	FER2 FER2CV04ANA FER2CV04SSR	3.50 (88.9)	3.11 (79.0)	2.50 (63.5)	1.25 (31.8)	1/4-28 UNF	1.06 (26.9)	1/8 NPT	1/2 NPT
0.866 to 0.945	FES222		FEB222									
0.945 to 1.024	FES223		FEB223									
1.024 to 1.102	FES224		FEB224									
1.102 to 1.181	FES225		FEB225									
1.181 to 1.260	FES226		FEB226									
1.260 to 1.339	FES227		FEB227									
1.339 to 1.417	FES228		FEB228									
1.417 to 1.510	FES229		FEB229									
1.496 to 1.614	FES331		FE3 FE3CV04ANA FE3CV04SSR									
1.614 to 1.732	FES332	FEB332										
1.732 to 1.850	FES333	FEB333										
1.850 to 1.969	FES334	FEB334										

Dimensions: inch (mm). Sealing Range listed in inches (1 in = 25.4 mm).

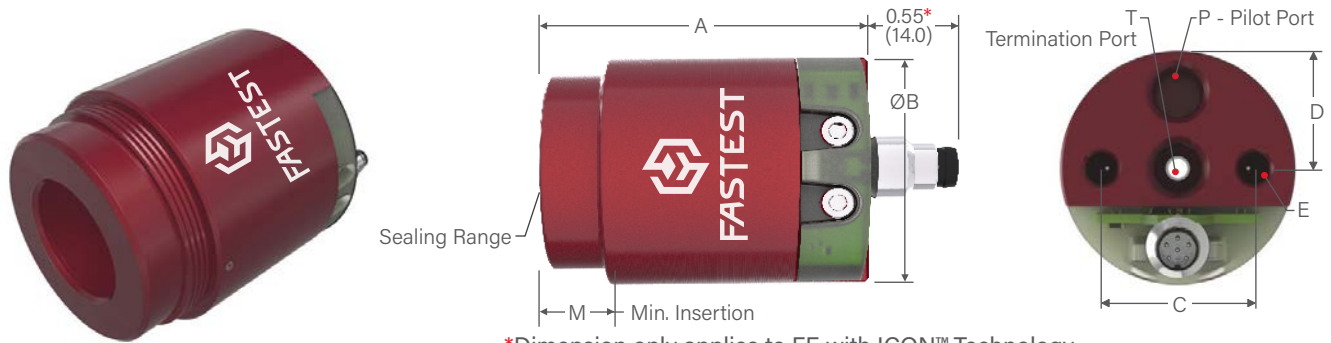
\*Includes seals(s) and metal parts for one complete seal set. Neoprene® seals are standard.

For Urethane seals, add "UR" suffix to Main Seal Set Part Number. Example: FES0101UR

\*\*Neoprene® seals are standard.

For Urethane seals, add "UR" suffix to Main Seal Set Part Number. Example: FEB0101UR

# FE / EXTERNAL SEALING CONNECTION TOOL / STRAIGHT TUBES & BORES



\*Dimension only applies to FE with ICON™ Technology (Base Part Numbers that include "CV04ANA" or "CV04SSR").

Ordering Information (Complete Connector = Main Seal Set + Base Part Number)					Dimensions							
Sealing Range	Main Seal Set*	Base Part Number	Replacement Seals Pack (5)**	Repair Kit	A	B	C	D	E	M	P	T

**FE | Connectors for Straight Tubes**

1.969 to 2.087	FES441	FE4 FE4CV04ANA FE4CV04SSR	FEB441	FER4 FER4CV04ANA FER4CV04SSR	4.60 (116.8)	5.48 (139.2)	4.25 (108.0)	2.13 (54.1)	1/4-28 UNF	1.64 (41.7)	1/8 NPT	1 1/2 NPT
2.087 to 2.205	FES442		FEB442									
2.205 to 2.323	FES443		FEB443									
2.323 to 2.441	FES444		FEB444									
2.441 to 2.559	FES445		FEB445									
2.559 to 2.677	FES446		FEB446									
2.677 to 2.795	FES447		FEB447									
2.795 to 2.913	FES448		FEB448									
2.913 to 3.032	FES449		FEB449									
2.970 to 3.100	FES551	FE5 FE5CV04ANA FE5CV04SSR	FEB551	FER5 FER5CV04ANA FER5CV04SSR	4.60 (116.8)	6.98 (177.3)	5.50 (139.7)	2.25 (57.15)	3/8-24 UNF	1.64 (41.7)	1/8 NPT	2 NPT
3.100 to 3.230	FES552		FEB552									
3.230 to 3.360	FES553		FEB553									
3.360 to 3.490	FES554		FEB554									
3.490 to 3.620	FES555		FEB555									
3.620 to 3.750	FES556		FEB556									
3.750 to 3.880	FES557		FEB557									
3.880 to 4.010	FES558		FEB558									
4.010 to 4.130	FES559		FEB559									
4.130 to 4.260	FES661	FE6 FE6CV04ANA FE6CV04SSR	FEB661	FER6 FER6CV04ANA FER6CV04SSR	4.97 (126.2)	7.48 (190.0)	6.12 (155.4)	3.06 (77.7)	3/8-24 UNF	1.64 (41.7)	1/8 NPT	2 1/2 NPT
4.260 to 4.390	FES662		FEB662									
4.390 to 4.520	FES663		FEB663									
4.520 to 4.650	FES664		FEB664									
4.650 to 4.780	FES665		FEB665									
4.780 to 4.910	FES666		FEB666									
4.910 to 5.040	FES667		FEB667									

Dimensions: inch (mm). Sealing Range listed in inches (1 in = 25.4 mm).

\*Includes seals(s) and metal parts for one complete seal set. Neoprene seals are standard. For Urethane seals, add "UR" suffix to Main Seal Set Part Number. Example: FES441UR

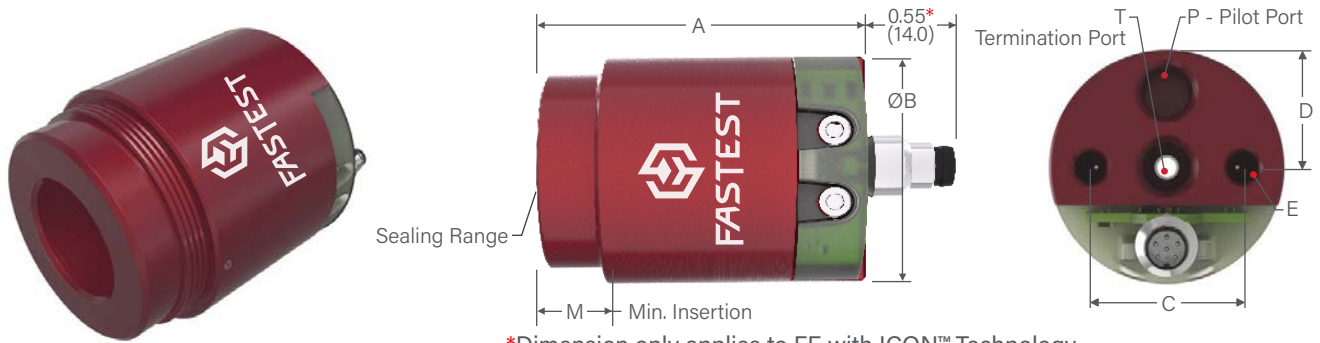
\*\*Neoprene® seals are standard.

For Urethane seals, add "UR" suffix to Main Seal Set Part Number. Example: FEB441UR



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# FE / EXTERNAL SEALING CONNECTION TOOL / NPT, BSPP (G), & BSPT THREADS



\*Dimension only applies to FE with ICON™ Technology (Base Part Numbers that include "CV04ANA" or "CV04SSR").

Ordering Information (Complete Connector = Main Seal Set + Base Part Number)					Dimensions							
Connects To	Main Seal Set*	Base Part Number	Replacement Seals Pack (5)**	Rebuild Kit	A	B	C	D	E	M	P	T

FE | Connectors for NPT, BSPP (G) and BSPT Threads

1/8	FES011/8NPT	FE01 FE01CV04ANA FE01CV04SSR	FEB011/8 NPT	FER01	1.72 (43.7)	0.84 (21.3)	0.63 (16.0)	N/A	10-32 UNF	0.58 (14.7)	10-32 UNF	1/8 NPT
1/4	FES111/4NPT	FE1 FE1CV04ANA FE1CV04SSR	FEB11/4NPT	FER1	2.72 (69.1)	2.22 (56.4)	1.62 (41.1)	0.81 (20.6)	1/4-28 UNF	0.61 (15.5)	1/8 NPT	1/4 NPT
3/8	FES131/8NPT	FE1 FE1CV04ANA FE1CV04SSR	FEB13/8NPT									
1/2	FES211/2NPT	FE2 FE2CV04ANA FE2CV04SSR	FEB21/2NPT	FER2	3.50 (88.9)	3.11 (79.0)	2.50 (63.5)	1.25 (31.8)	1/4-28 UNF	0.89 (22.6)	1/8 NPT	1/2 NPT
3/4	FES231/4NPT	FE2 FE2CV04ANA FE2CV04SSR	FEB23/4NPT									
1	FES21NPT	FE2 FE2CV04ANA FE2CV04SSR	FEB21NPT									
1-1/4	FES311/4NPT	FE3 FE3CV04ANA FE3CV04SSR	FEB311/4NPT	FER3	4.48 (113.8)	4.23 (107.4)	3.25 (82.6)	1.63 (41.4)	1/4-28 UNF	0.89 (22.6)	1/8 NPT	1 NPT
1-1/2	FES311/2NPT	FE3 FE3CV04ANA FE3CV04SSR	FEB311/2NPT									
2	FES42NPT	FE4 FE4CV04ANA FE4CV04SSR	FEB42NPT	FER4	4.60 (116.8)	5.48 (139.2)	4.25 (108.0)	2.13 (54.1)	1/4-28 UNF	0.89 (22.6)	1/8 NPT	1 1/2 NPT
2-1/2	FES421/2NPT	FE4 FE4CV04ANA FE4CV04SSR	FEB421/2NPT									

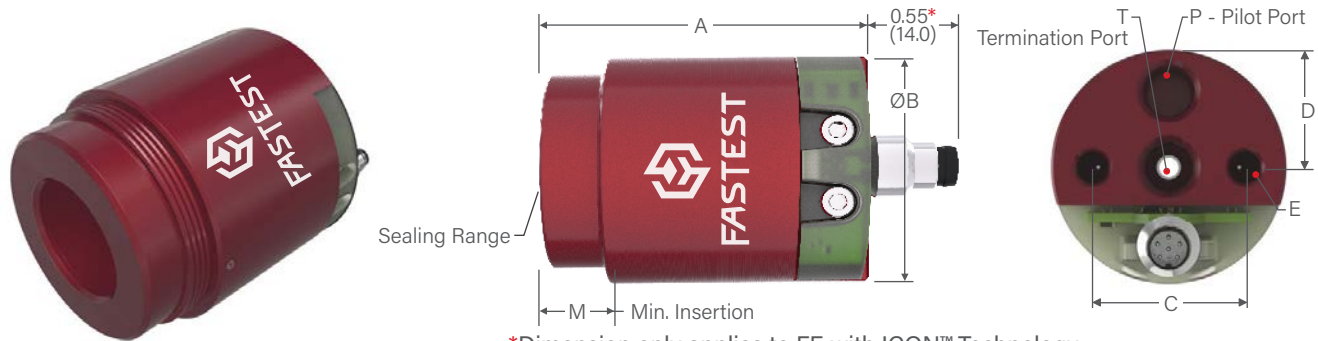
Dimensions: inch (mm)

\*Includes seals(s) and metal parts for one complete seal set. Urethane seals are standard.

**Port Specifications:** NPT per SAE J476; BSPP (G) per ISO 228; BSPT per ISO 7

**(i) NOTE:** For sealing external threads or irregular shapes with the FE connectors, typically 400 to 600 psi (27.6-41.4 bar) pilot pressure is required to seal deep rooted external threads (see pg. 64 Pilot Booster). **DO NOT** use a pilot booster with FI connectors.

# FE / EXTERNAL SEALING CONNECTION TOOL / SAE O-RING BOSS PORT THREADS



\*Dimension only applies to FE with ICON™ Technology (Base Part Numbers that include "CV04ANA" or "CV04SSR").

Ordering Information (Complete Connector = Main Seal Set + Base Part Number)					Dimensions							
Connects To	Main Seal Set*	Base Connector Part Number	Replacement Seals Package (5)	Rebuild Kit	A	B	C	D	E	M	P	T

**FE** | Connectors for Male Inch Straight Threads

7/16	FES010450UR	FE01 FE01CV04ANA FE01CV04SSR	FEB010450UR	FER01 FER01CV04ANA FER01CV04SSR	2.05 (52.1)	1.49 (37.8)	1.10 (27.9)	0.55 (14.0)	10-32 UNF	0.58 (14.7)	10-32 UNF	1/8 NPT
1/2	FES10510UR	FE1 FE1CV04ANA FE1CV04SSR	FEB10510UR	FER1 FER1CV04ANA FER1CV04SSR	2.72 (69.1)	2.22 (56.4)	1.62 (41.1)	0.81 (20.6)	1/4-28 UNF	0.61 (15.5)	1/8 NPT	1/4 NPT
9/16	FES10570UR		FEB10570UR									
5/8	FES10640UR		FEB10640UR									
11/16	FES10700UR		FEB10700UR									
3/4	FES2T0760UR	FE2 FE2CV04ANA FE2CV04SSR	FEB2T0760UR	FER1 FER1CV04ANA FER1CV04SSR	3.50 (88.9)	3.11 (79.0)	2.50 (63.5)	1.25 (31.7)	1/4-28 UNF	0.69 (17.5)	1/8 NPT	1/2 NPT
13/16	FES2T0800UR		FEB2T0800UR									
7/8	FES2T0885UR		FEB2T0885UR									
1	FES2T1010UR		FEB2T1010UR									
1-1/16	FES23/4NPT		FEB23/4NPT									
1-3/16	FES2T1200UR		FEB2T1200UR									
1-1/4	FES2T1260UR		FEB2T1260UR									
1-5/16	FES21NPT		FEB21NPT									
1-3/8	FES2T1385UR	FEB2T1385UR										
1-7/16	FES3T1460UR	FE3 FE3CV04ANA FE3CV04SSR	FEB3T1460UR	FER3 FER3CV04ANA FER3CV04SSR	4.48 (113.8)	4.23 (107.4)	3.25 (82.6)	1.63 (41.4)	1/4-28 UNF	0.89 (22.6)	1/8 NPT	1 NPT
1-5/8	FES3T1640UR		FEB3T1640UR									
1-11/16	FES3T1710UR		FEB3T1710UR									
1-7/8	FES3T1890UR		FEB3T1890UR									
2	FES4T2020UR	FE4 FE4CV04ANA FE4CV04SSR	FEB4T2020UR	FER3 FER3CV04ANA FER3CV04SSR	4.60 (116.8)	5.48 (139.2)	4.25 (108.0)	2.13 (54.1)	1/4-28 UNF	0.89 (22.6)	1/8 NPT	1 1/2 NPT
2-1/2	FES4T2520UR		FEB4T2520UR									

Dimensions: inch (mm)

\*Includes seals(s) and metal parts for one complete seal set. Urethane seals are standard.

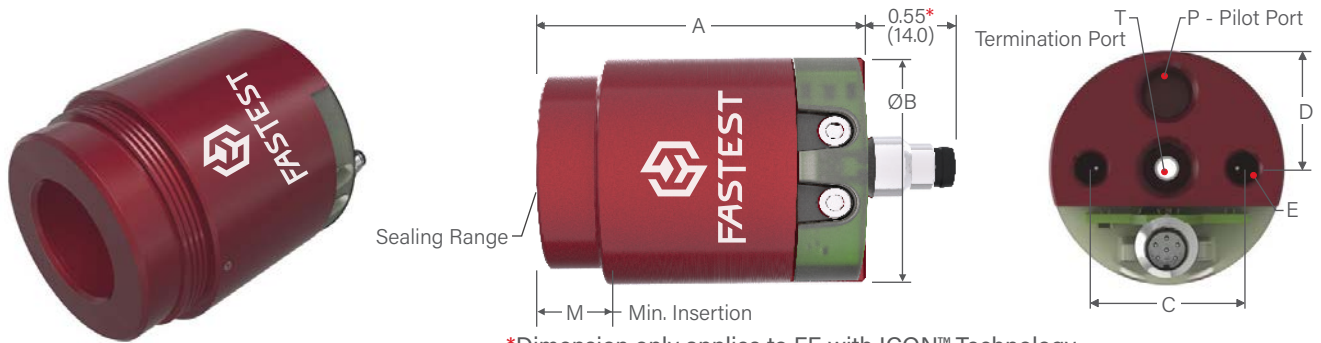
**Port Specifications:** O-Ring Port per SAE J1453; JIC 37° Flare per SAE J514; 45° Flare per SAE J512/513; 24° Cone per SAE J514

**NOTE:** For sealing external threads or irregular shapes with the FE connectors, typically 400 to 600 psi (27.6-41.4 bar) pilot pressure is required to seal deep rooted external threads (see pg. 64 Pilot Booster). DO NOT use a pilot booster with FI connectors.



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# FE / EXTERNAL SEALING CONNECTION TOOL / METRIC STRAIGHT THREADS



\*Dimension only applies to FE with ICON™ Technology (Base Part Numbers that include "CV04ANA" or "CV04SSR").

Ordering Information (Complete Connector = Main Seal Set + Base Part Number)					Dimensions							
Connects To	Main Seal Set*	Base Connector Part Number	Replacement Seals Package (5)	Rebuild Kit	A	B	C	D	E	M	P	T

FE | Connectors for Metric Straight Threads

M10	FES011/8NPT	FEM01 FEM01CV04ANA FEM01CV04SSR	FEB011/8NPT	FER01 FER01CV04ANA FER01CV04SSR	2.05 (52.1)	1.49 (37.8)	1.10 (27.9)	0.55 (14.0)	M5 x 1.0	0.58 (14.7)	M5 x 1.0	1/8 BSPP (G)
M12	FES10480UR	FEM1 FEM1CV04ANA FEM1CV04SSR	FEB10480UR	FER1 FER1CV04ANA FER1CV04SSR	2.72 (69.1)	2.22 (56.4)	1.62 (41.1)	0.81 (20.6)	M6 x 1.0	0.61 (15.5)	1/8 BSPP (G)	1/4 BSPP (G)
M14	FES10570UR		FEB10570UR									
M16	FES10640UR		FEB10640UR									
M18	FES10720UR		FEB10720UR									
M20	FES2T0800UR	FEM2 FEM2CV04ANA FEM2CV04SSR	FEB2T0800UR	FER2 FER2CV04ANA FER2CV04SSR	3.50 (88.9)	3.11 (79.0)	2.50 (63.5)	1.25 (31.8)	M6 x 1.0	0.69 (17.5)	1/8 BSPP (G)	1/2 BSPP (G)
M22	FES2T21UR		FEB2T21UR									
M24	FES2T22UR		FEB2T22UR									
M26	FES2T23UR		FEB2T23UR									
M27	FES2T1075UR		FEB2T1075UR									
M28	FES2T24UR		FEB2T24UR									
M30	FES2T25UR		FEB2T25UR									
M33	FES2T1320UR		FEB2T1320UR									
M35	FES2T1400UR	FEB2T1400UR										
M36	FES3T1440UR	FEM3 FEM3CV04ANA FEM3CV04SSR	FEB3T1440UR	FER3 FER3CV04ANA FER3CV04SSR	4.48 (113.8)	4.23 (107.4)	3.25 (82.6)	1.63 (41.4)	M6 x 1.0	0.89 (22.6)	1/8 BSPP (G)	1 BSPP (G)
M40	FES3T1595UR		FEB3T1595UR									
M42	FES3T1675UR		FEB3T1675UR									
M45	FES3T1790UR		FEB3T1790UR									
M48	FES4T1910UR	FEM4 FEM4CV04ANA FEM4CV04SSR	FEB4T1910UR	FER4 FER4CV04ANA FER4CV04SSR	4.60 (116.8)	5.48 (139.2)	4.25 (108.0)	2.13 (54.1)	M6 x 1.0	0.89 (22.6)	1/8 BSPP (G)	1 1/2 BSPP (G)
M52	FES4T2070UR		FEB4T2070UR									
M60	FES4T2380UR		FEB4T2380UR									

Dimensions: inch (mm)

\*Includes seals(s) and metal parts for one complete seal set. Urethane seals are standard.

**Port Specifications:** 24° Cone Flareless per ISO 8434-1 and -4, JIS B2353, DIN3902/3853/3861. 60° Cone per DIN 7831/7647.

**NOTE:** For sealing external threads or irregular shapes with the FE connectors, typically 400 to 600 psi (27.6-41.4 bar) pilot pressure is required to seal deep rooted external threads (see pg. 64 Pilot Booster). DO NOT use a pilot booster with FI connectors.

# FE / ACCESSORIES

## Pilot Booster PBA02

The Pilot Pressure Booster is an air over oil pressure intensifier. It uses 30-65psi (2.1-4.5bar) air pressure to generate 400-600psi (27.6-41.4bar) hydraulic pressure for sealing external threads and irregular surfaces with the FE Sealing Connection Tool. A sealing system consisting of an FE with a urethane main seal and the PB1015 Pressure Booster can produce the seal movement and long life performance needed in production testing applications.

Urethane sealing material is superior to Neoprene® material in high pressure, high abrasion, and high cycle applications. The increased elastomer movement required for sealing irregular shapes or into threads requires urethane seal material. Up to 600 psi pilot pressure is needed to seal deep root external threads. Production testing of threads and hard to seal surfaces can now be automated using the Pilot Pressure Booster and a proper sized urethane seal set in an FE.



**DO NOT USE WITH FI.**

Ordering Information	
Part Number	Description
PB1015	Pilot Pressure Booster
PBH32	1 quart hydraulic oil, 60 SSU petroleum based
A02M3	Manifold - 1/8" FNPT inlet with three 1/8" FNPT outlets
A02M4	Manifold - 1/8" FNPT inlet with four 1/8" FNPT outlets
A02M5	Manifold - 1/8" FNPT inlet with five 1/8" FNPT outlets
AT021R	Run Tee - 1/8" NPT
H012X036	Hose - 10-32 male x 1/8" NPT male - 36" length
H012X072	Hose - 10-32 male x 1/8" NPT male - 72" length
H022X018	Hose - 1/8" NPT male x 1/8" NPT male - 18" length
H022X036	Hose - 1/8" NPT male x 1/8" NPT male - 36" length
H022X072	Hose - 1/8" NPT male x 1/8" NPT male - 72" length
PBA01	1 quart hydraulic oil, 0-600 psi Gauge, Run Tee, Hose - 10-32 male by 1/8" MNPT - 72" length
PBA02	1 quart hydraulic oil, 0-600 psi Gauge, Run Tee, Hose - 1/8" MNPT by 1/8" MNPT - 72" length

### SPECIFICATIONS

Seals	Material	Inlet Port	
Buna-N	Aluminum	1/4 NPT	
Inlet Pressure	Outlet Pressure	Pressure Ratio	Displacement
65 psi max.	600 psi (41.4 bar)	9.2 to 1	1.5 in. <sup>3</sup>

Booster Guidelines
FE01 - 8 Connectors
FE1 - 4 Connectors
FE2 - 2 Connectors
FE3 - 1 Connector
FE4 - 1 Connector