

PNEUMATIC CYLINDERS
ISO 6431 SERIES TS & TM



OVERVIEW

BATTLEFIELD INTERNATIONAL

Battlefield International Inc. is a Canadian based designer and manufacturer of fluid power components. We began production in the fall of 1997 and are comprised of employees with many years experience in the pneumatics industry. We plan on a marketing strategy of sales through distributors and will support them in every way possible.



As we are developing our sales distribution team for the world market, we will be happy to deal directly with any end users or OEM companies that are not close to one of our distributors. We have a "no-minimum" billing policy, and want to ensure that access to our product is easy for everyone.



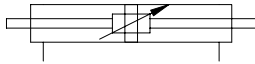
We believe that just as children are so full of potential and ability, our young, growing company can also realize the full results of our efforts. By working together as a team with enthusiasm and true enjoyment of our task, we can all be successful. Our progress to date can be attributed to the single-minded goal of being number one in our field, while building lasting relationships with our customers. We look forward to more worldwide market development.



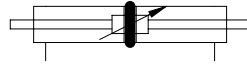
Battlefield International Inc. has developed a product line of pneumatic valves and cylinders. We offer ISO cylinders from 32 to 100 mm bore in any stroke required. Our standard delivery for these cylinders is 48 hours. Our cylinders are available with linear guide units, reed switch sensing, and many special rod and mount configurations. Our valves complement the cylinders very well by ensuring excellent cycle life, and are available with solenoid, manual, and pilot operators. The valves are available from M5 or 10/32" ported, to 1/2" NPT or BSP thread sizes. If you are only interested in a portion of our product line, we would still be very interested in hearing from you and exploring the potential business we could achieve together.



BORE SIZES	STANDARD MATERIALS	TEMPERATURE RANGE	PRESSURE RANGE
32 mm 40 mm 50 mm 63 mm 80 mm 100 mm	CAPS: machined and anodized aluminum TUBE: extruded and anodized aluminum ROD: X20 Cr13 stainless steel ROD BEARING: bronze, self lubricating SEALS: NBR, 70 shore MOUNTING SCREWS: steel; zinc or nickel plated	-20C....+80C	1-10 bar



DS-Schematic



DM-Schematic

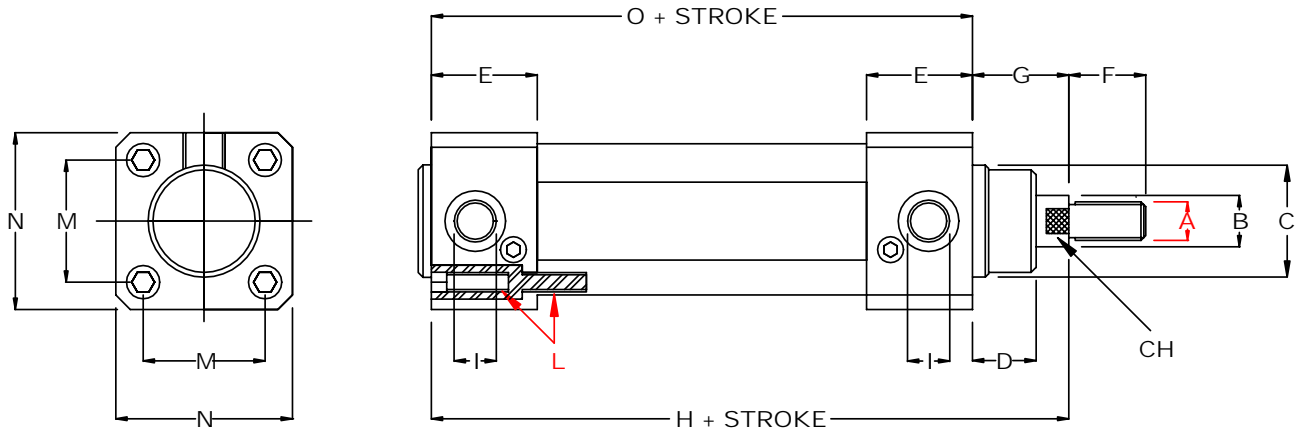


TS-Schematic



TM-Schematic

Series TS and TM are constructed with clean-profile aluminum. Adjustable air-cushions are standard. The caps are machined, not die cast and are well-suited to the food industry or areas requiring wash-down. We make these cylinders right here, usually the same day they are ordered. Specials are no problem. We do not list any standard strokes as any stroke is easily produced from 1mm to 2000mm.



CYL DIA (mm)	Part Number With Standard Piston	Part Number With Magnetic Piston	A	B	C	D	E	F	G	H	I	L	M	N	O	CH
32	TS-32-stroke in mm	TM-32-stroke in mm	M10 X 1.25	12	30	16	32	22	26	120	1/8	M6	32.5	45	94	10
40	TS-40-stroke in mm	TM-40-stroke in mm	M12 X 1.25	16	35	20	33	24	30	135	1/4	M6	38	55	105	14
50	TS-50-stroke in mm	TM-50-stroke in mm	M16 X 1.5	18	40	25	34	32	37	143	1/4	M8	46.5	65	106	17
63	TS-63-stroke in mm	TM-63-stroke in mm	M16 X 1.5	20	45	25	39	32	37	158	3/8	M8	56.5	75	121	17
80	TS-80-stroke in mm	TM-80-stroke in mm	M20 X 1.5	25	45	33	38.5	40	46	174	3/8	M10	72	95	128	22
100	TS-100-stroke in mm	TM-100-stroke in mm	M20 X 1.5	25	55	38	45	40	51	189	1/2	M10	89	115	138	22

For double-rod cylinders, just add the dimensions “G” and “F” to the rear of the cylinder or the left side as shown above. For a detailed part-number guide to assist you in constructing your own special-request **Battlefield International** cylinder, please consult our chart on the next page. If you require specials that do not appear on the next page, please consult the factory.

BATTLEFIELD ISO 6431 CYLINDER PART-NUMBER GUIDE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
T	M	-	5	0		-	1	2	5					



DIGIT 1	BASIC CYL STYLE
T	Standard
D	Double Rod
E	Extended Rod
F	Extended & Double Rod
G	Special Thread Only
H	Spec Thread & Dbl Rod
J	Spec Thread & Ext Rod
K	Spec Thd,Dbl Rod, Ext Rod

DIGIT 2	SEAL and CR Options
S	Non Magnetic Standard
M	Magnetic Standard
V	Viton (Non-Magnetic Only)
C	Corrosion Res Non-Mag
L	Corrosion Res Magnetic
P	Corr. Res Viton Non-Mag

DIGIT 3	THREAD TYPE
-	Standard
C	Inch Thread
M	Metric Thread Non-Standard
L	Full Thread on Rod Extension (inch or metric)

DIGITS 4-6	BORE
32-100	Bore in mm 32,40,50,63,80,or 100

DIGIT 7	ROD THREAD SIZE	DIGIT 7	ROD THREAD SIZE
-	Standard	J	9/16" — 18
A	No Thread	K	1/2" — 20
B	5/16" — 24	L	M16 X 1.5
C	5/16" Female	M	9/16" — 20
D	3/8" — 16	N	5/8" — 18
E	M12 X 1.25	U	7/8" — 14
F	7/16" — 20	S	3/4" — 16
G	3/8" — 24	W	1" — 8
I	M14 x 1.5		

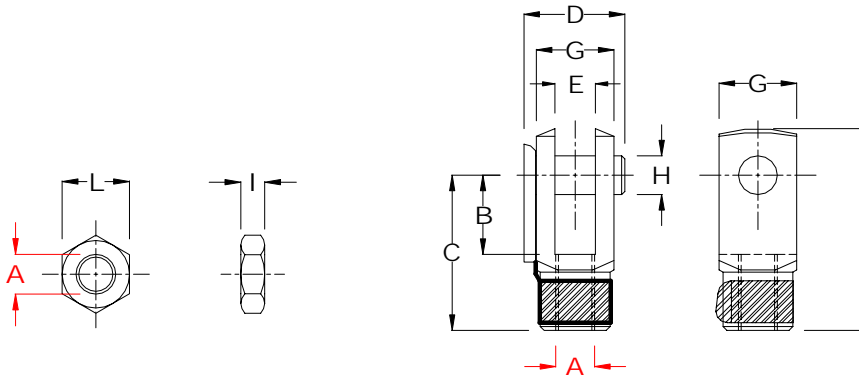
DIGITS 8-11 (Numeric)	Stroke in mm
1-9999	Exact stroke in mm

DIGIT 12	Special PORTS and OPTIONS
-	Standard dash if Rod Extension
N	Ports are NPT
A	Spring Return (Limited Availability)
B	Spring Extend (Limited Availability)
D	Rear Porting Option (Consult Factory)
E	Center Rear Port .750-UNF
H	2" of Rod Thread
I	5/16 NC side tap mount holes 3 sides
K	Machined Nose cap dim C=32mm
M	Rod Scraper on Front Cap

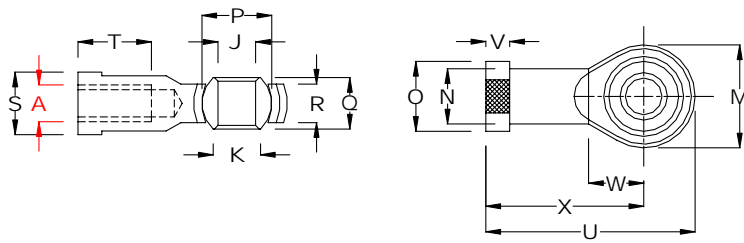
DIGITS 13-15	ROD EXTENSION AMOUNT
1-999	Rod Extension in mm

BATTLEFIELD INTERNATIONAL ISO 6431 CYLINDER

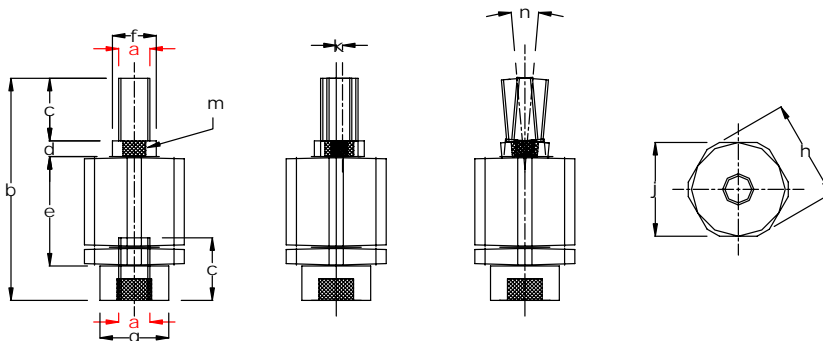
SERIES TS & TM MOUNTING HARDWARE



CYL DIA (mm)	Rod Nut Part Number	I	L	Female Rod Clevis Part Number	A	B	C	D	E	F	G	H
32	FE-32	6	17	FD-32	M10 X 1.25	20	40	25	10	52	20	10
40	FE-40	7	19	FD-40	M12 X 1.25	24	48	30	12	62	24	12
50 & 63	FE-50.63	8	24	FD-50.63	M16 X 1.5	32	64	41	16	83	32	16
80 & 100	FE-80.100	9	30	FD-80.100	M20 X 1.5	40	80	49	20	105	40	20



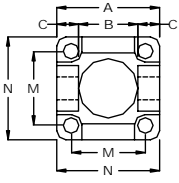
CYL DIA (mm)	Spherical Rod Eye Part Number	A	J	K	M	N	O	P	Q	R	S	T	U	V	W	X
32	FO-32	M10 X 1.25	10	12.9	28	15	19	19	14	10.5	17	20	57	6.5	15	43
40	FO-40	M12 X 1.25	12	15.4	32	17.5	22	22.2	16	12	19	22	66	6.5	17	50
50 & 63	FO-50.63	M16 X 1.5	16	19.3	41	22	28	28.5	21	15	25	28	85	8	23	64
80 & 100	FO-80.100	M20 X 1.5	20	24.3	47	28	34	34.9	25	18	31	33	100	10	26	76



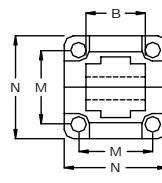
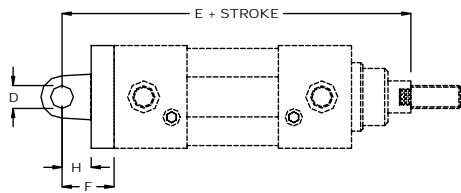
CYL DIA (mm)	Alignment Coupler Part Number	a	b	c	d	e	f	g	h	j	k= max mm	m	n= maximum degrees
32	FK-32	M10 X 1.25	74	24	5	35	14	22	32	30	2	12	10
40	FK-40	M12 X 1.25	74	23	5	35	14	22	32	30	2	12	10
50 & 63	FK-50.63	M16 X 1.5	103	31	7	54	22	32	45	41	2	20	10
80 & 100	FK-80.100	M20 X 1.5	112	40	7	54	22	32	45	41	2	20	10

**SERIES TS & TM
MOUNTING HARDWARE**

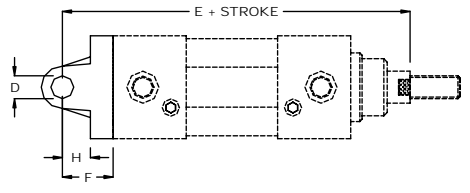
BATTLEFIELD INTERNATIONAL ISO 6431 CYLINDER



TC



TG



**TC-32-KIT
REAR CLEVIS
DUAL TANG**



**TG-32-KIT
REAR CLEVIS
SINGLE TANG**

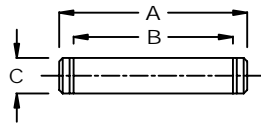


**FF-32
CLEVIS PIN**



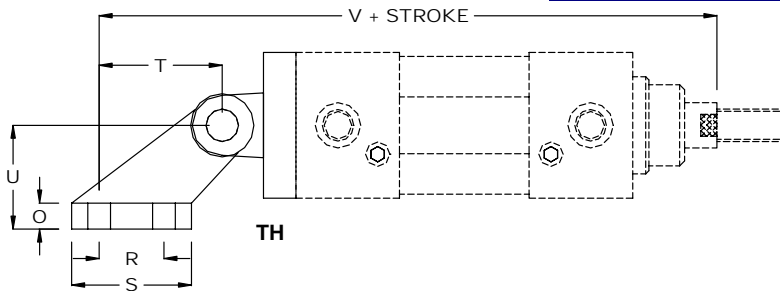
**TH-32-KIT
CLEVIS FOOT**

CYL DIA (mm)	Rear Clevis Dual Tang Part Number	Rear Clevis Single Tang Part Number	A	B	C	D	E	F	G	H	M	N
32	TC-32-KIT	TG-32-KIT	45	26	9.5	10	142	22	10	12	32.5	45
40	TC-40-KIT	TG-40-KIT	52	28	12	12	160	25	12	15	38	52
50	TC-50-KIT	TG-50-KIT	65	32	14	12	170	27	12	15	46.5	65
63	TC-63-KIT	TG-63-KIT	75	40	15	16	190	32	16	20	56.5	75
80	TC-80-KIT	TG-80-KIT	95	50	20	16	210	36	16	22	72	95
100	TC-100-KIT	TG-100-KIT	115	60	25	20	230	41	20	22	89	115

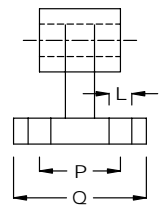


FF

CYL DIA (mm)	Clevis Pin Part Number	A	B	C
32	FF32	53	46	10
40	FF-40	60	53	12
50	FF-50	68	61	12
63	FF-63	78	71	16
80	FF-80	98	91	16
100	FF-100	118	111	20



TH

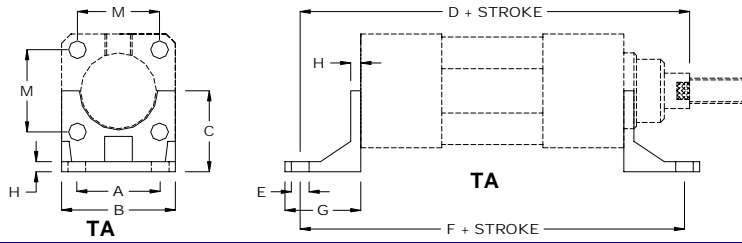


TH

CYL DIA (mm)	Foot Clevis	L	O	P	Q	R	S	T	U	V
32	TH-32	6.5	8	25	41	20	37	38	32	180
40	TH-40	9	10	32	52	32	54	57	45	217
50	TH-50	9	10	32	52	32	54	57	45	227
63	TH-63	11.5	12	40	63	50	75	82	63	272
80	TH-80	11.5	12	40	63	50	75	82	63	292
100	TH-100	14.5	16	50	80	70	103	110	90	340

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SERIES TS & TM
MOUNTING HARDWARE



CYL DIA (mm)	Foot Mount Part Number	Foot Mount Part Number	A	B	C	D	E	F	G	H	M	J	K	L
32	TA-32-KIT	PA-32-KIT	32	45	32	144	7	142	35	4	32.5	8	35	45
40	TA-40-KIT	PA-40-KIT	36	51.5	36	163	9	161	36	4	38	8	35	52.5
50	TA-50-KIT	PA-50-KIT	45	62	45	175	9	170	42	5	46.5	10	45	65
63	TA-63-KIT	PA-630-KIT	50	75	50	190	9	185	45	5	56.5	10	45	75
80	TA-80-KIT	PA-80-KIT	63	95	63	215	12	210	55	6	72	12	55	95
100	TA-100-KIT	PA-100-KIT	75	115	71	230	14	220	58	6	89	12	56	115



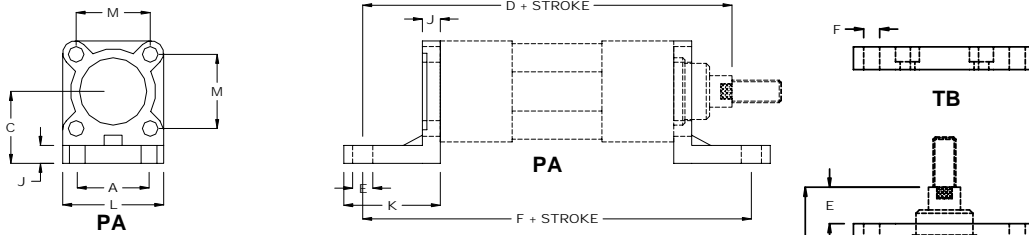
TA-32-KIT
FOOT MOUNT



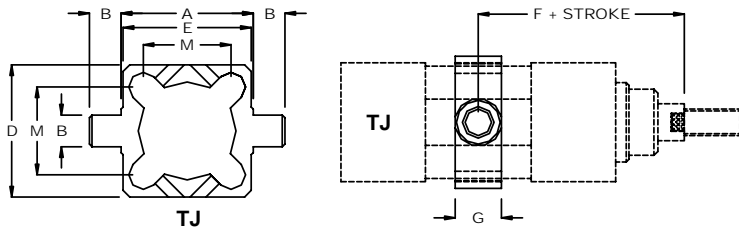
PA-32-KIT
FOOT MOUNT



TB- 32-KIT
FLANGE MOUNT



CYL DIA (mm)	Front / Rear Flange Mount Part Number	A	B	C	D	E	F	G	M	N
32	TB-32-KIT	64	32	45	80	16	7	10	32.5	130
40	TB-40-KIT	72	36	52	90	20	9	10	38	145
50	TB-50-KIT	90	45	65	110	25	9	12	46.5	155
63	TB-63-KIT	100	50	75	120	25	9	12	56.5	170
80	TB-80-KIT	126	63	95	150	30	12	16	72	190
100	TB-100-KIT	150	75	115	170	35	14	16	89	205



CYL DIA (mm)	Trunion Part Number	A	B	D	E	G	M	F + stroke minimum	F + stroke maximum
32	TJ-32	50	12	50	49	18	32.5	70.5	75.5
40	TJ-40	63	16	60	60	20	38	75.5	89.5
50	TJ-50	75	16	71	71	20	46.5	83.5	96.5
63	TJ-63	90	20	85	85	26	56.5	91	104
80	TJ-80	110	20	106	106	26	72	99.5	120.5
100	TJ-100	132	25	130	130	32	89	116	124



TJ- 32
TRUNION MOUNT

**SERIES TS & TM
GUIDE UNIT GLH**

BATTLEFIELD INTERNATIONAL ISO 6431 CYLINDER

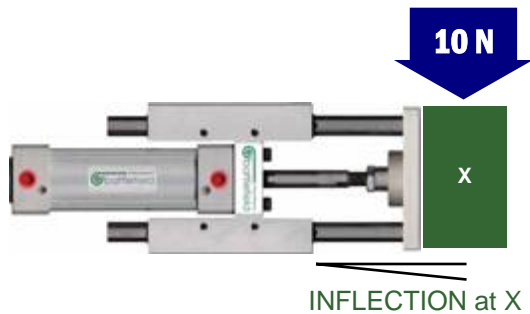
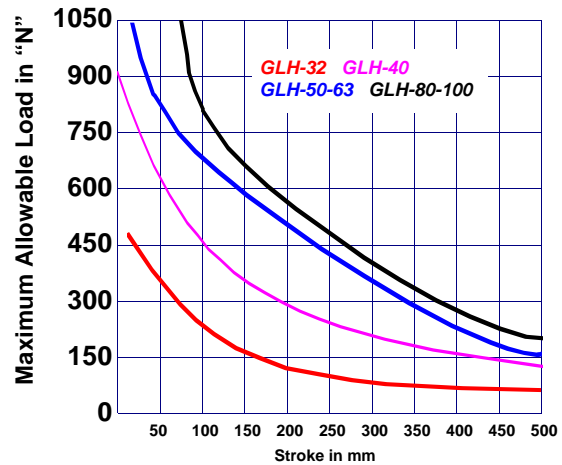


BORE SIZES	STANDARD MATERIALS	TEMPERATURE RANGE	PRESSURE RANGE
32 mm 40 mm 50 mm 63 mm 80 mm 100 mm	BODY: machined and anodized aluminum SHAFTS: chrome plated, hardened, and rectified steel ROD BEARINGS: bronze, with grease nipples SEALS: NBR, 70 shore MOUNTING SCREWS: steel; zinc or nickel plated	-20C.....+80C	1-10 bar

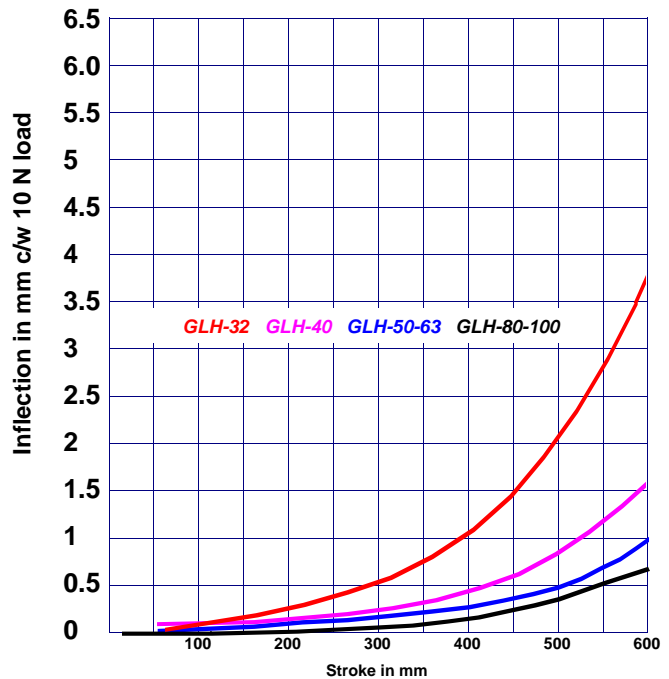
GLH Guide Units are used with series TS & TM cylinders. Battlefield International Guide Units provide an easy solution for designers requiring bearings in conjunction with their cylinder application. Anti-rotation is ensured with two steel guide stems which glide between four bronze bearings. The piston rod is connected to the front flange by a floating joint. The use of high quality materials and precision manufacturing techniques allows for excellent performance with high resistance to side loads. Pre-drilled mounting threads allow for installation without any additional mounting plates. If you do require a mounting flange, we offer our GLH-bore-P as shown on the next page. For load ratings, please consult the charts below, and part numbers can be found on the next page in this catalogue. We do not list any standard strokes as any stroke is easily produced from 1mm to 2000mm to match your cylinder. Battlefield's GLH includes the required mounting hardware to attach to the cylinder.



Maximum Allowable Load Chart. With the longitudinal axis of the GLH horizontally placed as shown directly above. Please consult the upper-right chart for the maximum allowable load in "N"

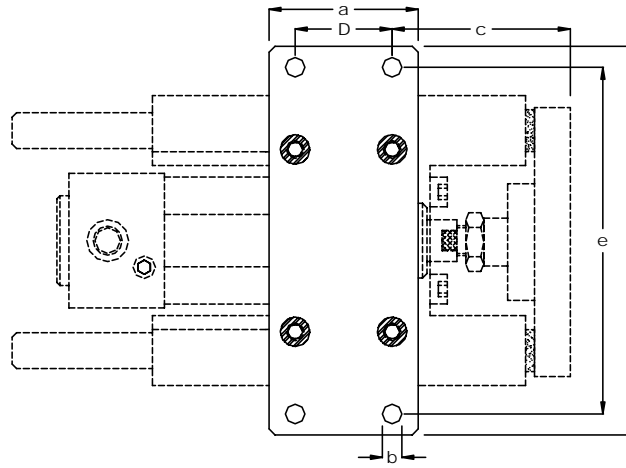
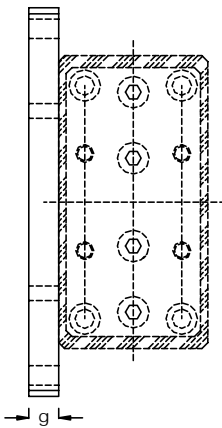
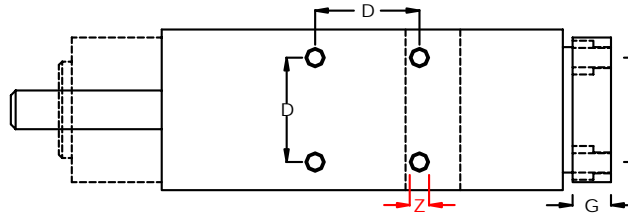
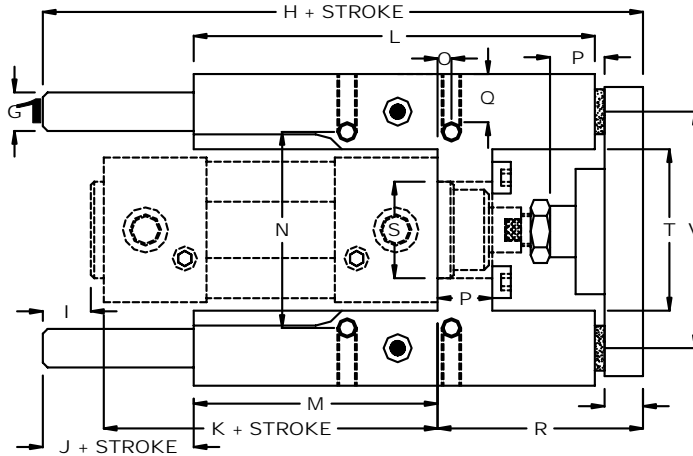
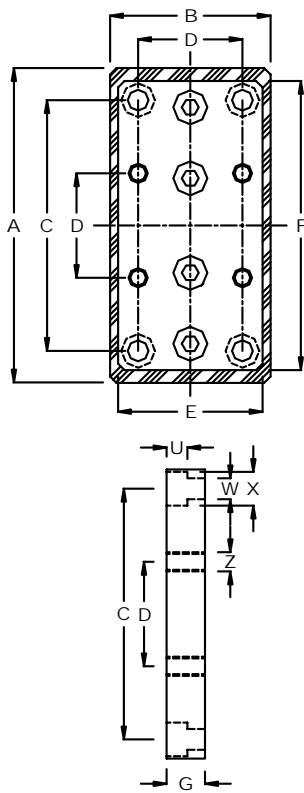


Inflection of Guide Shafts. Inflection will occur as the load and strokes are increased as shown above. The chart at the right demonstrates the inflections that will occur as the stroke is increased. This is based on a load of 10 N



BATTLEFIELD INTERNATIONAL ISO 6431 CYLINDER

SERIES TS & TM GUIDE UNITS TYPE



**GLH- 32
GUIDE UNIT**



**GLH- 32-P
GUIDE MOUNT**

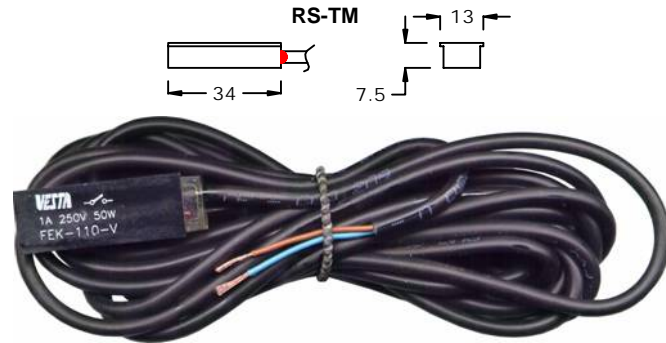
GLH-bore-P mounting plates are available for all bores from 32-100mm. Dimensions are shown below. Just specify the bore as shown above.

CYL DIA mm	Part Number Guide Unit-stroke in mm	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Z	a	b	c	e	f	g
32	GLH-32-stroke	97	50	78	32.5	45	90	12	177	15	37	94	125	76	61	4.3	17	14	71	30	50.2	6.5	74	6.5	10.5	M6	50	6.5	59.7	116	130	10
40	GLH-40-stroke	115	58	84	38	50	105	16	192	9	37	105	136	81	69	11	21	14	76	35	58.2	6.5	87	6.5	10.5	M6	55	9	63	140	160	10
50	GLH-50-stroke	137	70	100	46.5	60	124	20	237	8	37	106	144	79	85	18.8	26	16	94	40	70.2	9	104	9	13.5	M8	70	9	70.2	160	180	12
63	GLH-63-stroke	152	85	105	56.5	70	145	20	237	23	37	121	176	111	100	15.3	26	16	94	45	85.2	9	119	9	13.5	M8	80	9	73.7	175	195	12
80	GLH-80-stroke	189	105	130	72	100	180	25	280	40	42	128	215	128	130	21	34	20	112	45	105.4	11	148	11	18	M10	100	12	89	218	242	15
100	GLH-100-stroke	213	130	150	89	120	200	25	280	25	37	138	220	128	150	24.5	39	20	117	55	130.4	11	173	11	18	M10	120	14	90.5	245	272	15

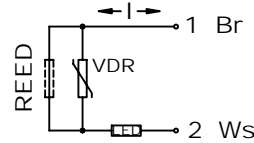
**SERIES TS & TM
REED SWITCH SENSING**

BATTLEFIELD INTERNATIONAL ISO 6431 CYLINDER

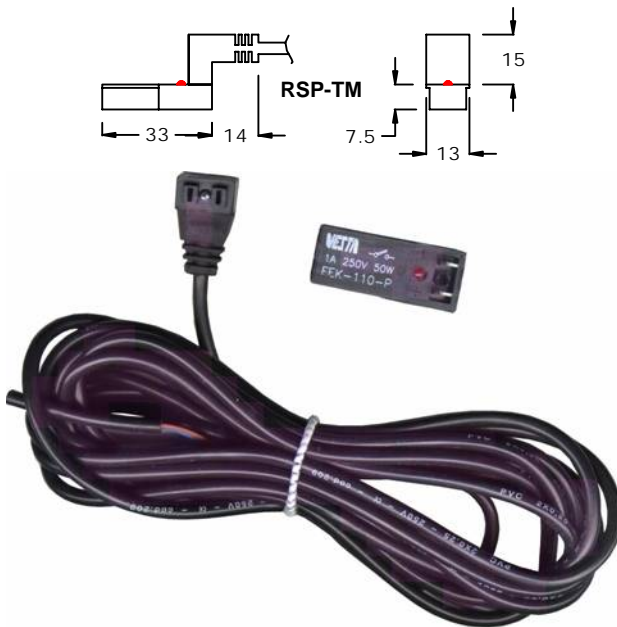
RS and RSP switches work with all styles of PLC's and most input requirements. A set of contacts close when the switch is directly over the magnetic style " TM " piston enabling cylinder position detection. *These switches can operate with any voltage between 3 and 250, at 1 amp.*



RS-TM
REED SWITCH (Direct Cable)



Part Number	RS-TM & RSP-TM
Weight	30g
Length of Cable	3 m
Temperature Range	-30...+80 C
Degree of Protection	IP 67
Release Time	< 0.1 ms
Switching Time	< 2 ms
Electrical Life Term	10 000 000
Repeatability	+ / - 0.1 mm
Contact Function	Normally Open
Shock Resistance	50 g / 11 ms
Vibration Resistance	50....1000 Hz
Max. Current at 25C (resistive load)	1A
Max. Power DC / AC	50 W / 50 VA
Voltage DC / AC	3...250 V
Max. Voltage Drop	3 V
Wire Gauge	0.34 sq mm



RSP-TM
REED SWITCH (Plug Style)



Cylinder Diameter (mm)	Mounting Bracket For RS-TM and RSP-TM Switches
32 40	RSCLAMP-32-40
50 63 80	RSCLAMP-50-63-80
100	RSCLAMP-100-125

Battlefield International offers all repair parts for our cylinders in one convenient “repair kit” package. Our repair kits include the piston, buna ring seals, cushions, and a small grease packet. We also offer replacement piston rods and all other parts on request.



Cylinder Bore	Part Number <i>Complete Repair Kit For TS style non-magnetic cylinders</i>	Part Number <i>Complete Repair Kit For TM style magnetic piston cylinders</i>	Part Number <i>Complete Repair Kit For TV style viton cylinders</i>
32	TSRK-32	TMRK-32	TVRK-32
40	TSRK-40	TMRK-40	TVRK-40
50	TSRK-50	TMRK-50	TVRK-50
63	TSRK-63	TMRK-63	TVRK-63
80	TSRK-80	TMRK-80	TVRK-80
100	TSRK-100	TMRK-100	TVRK-100

BATTLEFIELD INTERNATIONAL RESERVOIR

**RESERVOIR
SERIES RES**

DIAMETER AVAILABLE	STANDARD MATERIALS	TEMPERATURE RANGE	PRESSURE RANGE
32 mm 40 mm 50 mm 63 mm 80 mm 100 mm	CAPS: machined and anodized aluminum TUBE: extruded and anodized aluminum SEALS: NBR, 70 shore MOUNTING SCREWS: steel; zinc or nickel plated	-20C....+80C	1-10 bar



Series RES reservoirs enable engineers to control the exact size of their air storage tank. This clean profile solution is a welcome visual enhancement to the standard compressed air storage tanks. Made with the same extrusions and caps as our series TS and TM cylinders, it can complement the overall appearance of an automated system. This product can be manufactured and shipped the same day ordered and is very reasonably priced. We do not list any standard lengths as any size is easily produced for each diameter from 1mm to 2000mm in length. If you require assistance in calculating your required volume and selecting a RES part number, do not hesitate to call us at Battlefield International for help. Any mounting hardware in this catalogue is compatible with this product.

PNEUMATIC RESERVOIR Diameter in (mm)	Part Number <i>Dimensions can be calculated by referring to page 2 in this catalogue.</i>
32	RES-32-exact length of extruded tube in mm
40	RES-40- exact length of extruded tube in mm
50	RES-50-exact length of extruded tube in mm
63	RES-63-exact length of extruded tube in mm
80	RES-80-exact length of extruded tube in mm
100	RES-100-exact length of extruded tube in mm