

RECOMENDACIONES

1. Al momento de realizar los ensayos para la obtención de las curvas características del ventilador, se debe de tener en cuenta las pérdidas que se producen dentro del banco, tales como la sección de transición en caso sea empleada, las uniones como bridas, el redocople y las conexiones flexibles.
2. Las pruebas para un trabajo específico (velocidad constante, caudal constante, etc.) debe constar de al menos tres (3) puntos de ensayo para determinar la curva característica del ventilador.
3. El ventilador debe ser ensayado en la forma en que es suministrado, es decir sin adiciones especiales (tales como entrada cónica, difusor, salvaguardas, etc.) a excepción de los conductos de aire de prueba, y sin la eliminación de cualquier componente que pueda afectar el flujo.
4. Si bien en el diseño de este banco se indican las piezas y materiales a emplear, se pueden emplear otros siempre y cuando, cumplan la misma función y se encuentren de acuerdo al rendimiento detallado en las normas técnicas.



ANEXOS

ANEXO 1

Coefficiente de caudal (α) para toberas usadas en cámara de ensayo

Nozzle flow rate coefficient α	Reynolds number, Re_d	
	$L/d = 0,5$	$L/d = 0,6$
0,950	12 961	14 720
0,951	13 657	15 491
0,952	14 401	16 314
0,953	15 196	17 195
0,954	16 047	18 137
0,955	16 961	19 148
0,956	17 942	20 234
0,957	18 998	21 402
0,958	20 136	22 661
0,959	21 365	24 021
0,960	22 695	25 492
0,961	24 137	27 086
0,962	25 703	28 817
0,963	27 407	30 701
0,964	29 268	32 758
0,965	31 303	35 006
0,966	33 535	37 472
0,967	35 989	40 184
0,968	38 697	43 174
0,969	41 693	46 482
0,970	45 018	50 153
0,971	48 723	54 242
0,972	52 866	58 815

Nozzle flow rate coefficient α	Reynolds number, Re_d	
	$L/d = 0,5$	$L/d = 0,6$
0,973	57 519	63 948
0,974	62 766	69 736
0,975	68 713	76 295
0,976	75 488	83 765
0,977	83 249	92 320
0,978	92 195	102 180
0,979	102 576	113 620
0,980	114 715	126 992
0,981	129 024	142 753
0,982	146 048	161 500
0,983	166 513	184 032
0,984	191 401	211 428
0,985	222 073	245 182
0,986	260 450	287 409
0,987	309 324	341 172
0,988	372 865	411 057
0,989	457 538	504 164
0,990	573 788	631 966
0,991	739 389	813 986
0,992	986 593	1 085 643
0,993	1 378 954	1 516 727
0,994	2 056 291	2 260 760
0,995	3 377 887	3 712 194

ANEXO 2

Factor de expansibilidad (ϵ) para boquillas usadas dentro de una cámara.

Static pressure ratio r_d	Ratio of diameters, β					
	0	0,20	0,25	0,30	0,40	0,50
	Expansibility factor, ϵ					
1,00	1,000 00	1,000 00	1,000 00	1,000 00	1,000 00	1,000 00
0,98	0,989 23	0,989 21	0,989 17	0,989 11	0,988 86	0,988 29
0,96	0,978 34	0,978 29	0,978 23	0,978 11	0,977 61	0,976 50
0,94	0,967 32	0,967 26	0,967 16	0,966 99	0,966 25	0,964 61
0,92	0,956 19	0,956 10	0,955 98	0,955 75	0,954 78	0,952 63
0,90	0,944 92	0,944 81	0,944 66	0,944 38	0,943 19	0,940 55



ANEXO 3

Presión de Saturación, P_{sat} , de agua como función de la Temperatura de bulbo húmedo

Wet bulb temperature T_w °C	Saturation vapour pressure, P_{sat} , of water (above water) hPa									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
-4	4.55	4.51	4.48	4.44	4.41	4.37	4.35	4.31	4.28	4.24
-3	4.69	4.67	4.63	4.70	4.75	4.72	4.68	4.65	4.61	4.59
-2	5.28	5.24	5.20	5.16	5.12	5.08	5.04	5.01	4.97	4.93
-1	6.00	5.94	5.89	5.84	5.80	5.77	5.74	5.70	5.66	5.63
0	6.11	6.07	6.03	6.07	6.03	6.00	5.94	5.90	5.78	5.72
1	6.11	6.16	6.19	6.24	6.29	6.33	6.37	6.43	6.47	6.52
2	6.56	6.61	6.67	6.71	6.76	6.80	6.85	6.91	6.95	7.00
3	7.05	7.11	7.16	7.21	7.26	7.31	7.36	7.41	7.47	7.52
4	7.57	7.63	7.68	7.73	7.78	7.83	7.91	7.96	8.01	8.06
5	8.13	8.19	8.24	8.31	8.35	8.43	8.48	8.53	8.60	8.65
6	8.72	8.79	8.84	8.91	8.95	9.03	9.09	9.16	9.21	9.28
7	9.36	9.41	9.48	9.53	9.61	9.66	9.75	9.81	9.88	9.95
8	10.01	10.08	10.15	10.23	10.29	10.36	10.43	10.51	10.57	10.65
9	10.72	10.80	10.87	10.95	11.01	11.09	11.17	11.24	11.32	11.40
10	11.40	11.55	11.63	11.71	11.79	11.87	11.95	12.03	12.11	12.19
11	12.27	12.38	12.44	12.52	12.61	12.69	12.77	12.87	12.95	13.04
12	13.12	13.21	13.29	13.38	13.47	13.56	13.65	13.75	13.84	13.93
13	14.01	14.11	14.20	14.29	14.39	14.48	14.59	14.68	14.77	14.87
14	14.97	15.07	15.17	15.27	15.36	15.47	15.57	15.67	15.77	15.88
15	16.07	16.08	16.19	16.29	16.40	16.51	16.61	16.72	16.83	16.94
16	17.04	17.16	17.27	17.37	17.48	17.60	17.72	17.83	17.94	18.05
17	18.17	18.29	18.41	18.52	18.64	18.76	18.88	19.00	19.12	19.25
18	19.37	19.49	19.61	19.73	19.87	19.99	20.12	20.24	20.37	20.51
19	20.63	20.76	20.89	21.03	21.16	21.29	21.43	21.56	21.69	21.83
20	21.96	22.11	22.24	22.38	22.52	22.67	22.80	22.95	23.09	23.23
21	23.37	23.52	23.67	23.81	23.96	24.11	24.26	24.41	24.56	24.71
22	24.87	25.01	25.17	25.32	25.48	25.64	25.80	25.95	26.11	26.27
23	26.43	26.60	26.76	26.92	27.08	27.25	27.41	27.58	27.75	27.92
24	28.09	28.25	28.43	28.60	28.77	28.95	29.12	29.31	29.48	29.65
25	29.84	30.01	30.19	30.37	30.56	30.75	30.92	31.11	31.29	31.48
26	31.68	31.87	32.06	32.24	32.44	32.63	32.83	33.01	33.21	33.41
27	33.61	33.81	34.01	34.21	34.41	34.61	34.83	35.03	35.24	35.44
28	35.65	35.87	36.08	36.29	36.49	36.71	36.93	37.15	37.36	37.57
29	37.90	38.03	38.24	38.47	38.69	38.92	39.15	39.37	39.60	39.83
30	40.05	40.29	40.52	40.75	41.00	41.23	41.47	41.71	41.95	42.19
31	42.43	42.68	42.92	43.17	43.41	43.67	43.92	44.17	44.43	44.68
32	44.95	45.19	45.44	45.71	45.96	46.23	46.49	46.75	47.01	47.28
33	47.56	47.83	48.09	48.37	48.64	48.92	49.19	49.47	49.75	50.03
34	50.31	50.60	50.88	51.16	51.45	51.73	52.03	52.32	52.61	52.91
35	53.29	53.51	53.80	54.11	54.40	54.71	55.01	55.32	55.63	55.93
36	56.24	56.55	56.87	57.17	57.49	57.81	58.13	58.45	58.77	59.11
37	59.43	59.76	60.08	60.41	60.75	61.08	61.41	61.75	62.08	62.43
38	62.77	63.11	63.45	63.80	64.15	64.49	64.85	65.20	65.55	65.91

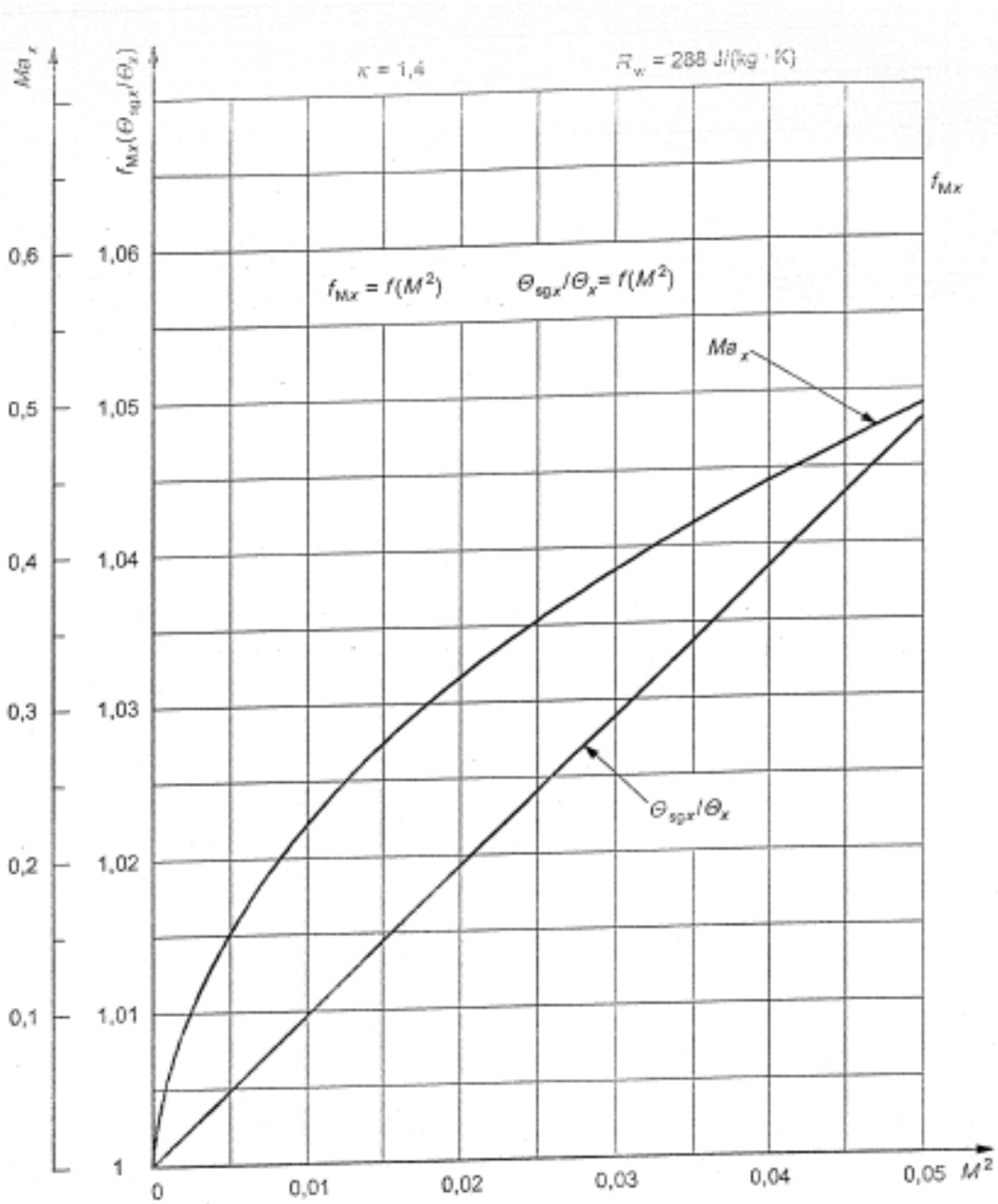
ANEXO 3 (continuación....)

Wet bulb temperature T_w °C	Saturation vapour pressure, p_{sat} , of water (above water) hPa									
	0,0	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9
38	66,27	66,63	66,99	67,35	67,72	68,08	68,45	68,83	69,19	69,56
39	69,95	70,32	70,69	71,07	71,45	71,84	72,23	72,61	73,00	73,39
40	73,79	74,17	74,57	74,97	75,37	75,77	76,17	76,59	76,99	77,40
41	77,81	78,23	78,64	79,05	79,47	79,89	80,32	80,73	81,16	81,59
42	82,03	82,45	82,89	83,32	83,76	84,20	84,64	85,08	85,53	85,97
43	86,43	86,88	87,33	87,79	88,25	88,71	89,17	89,64	90,11	90,57
44	91,04	91,52	91,99	92,47	92,95	93,43	93,91	94,40	94,88	95,37
45	95,87	96,36	96,85	97,35	97,85	98,36	98,85	99,36	99,88	100,39
46	100,89	101,41	101,93	102,45	102,97	103,51	104,04	104,57	105,09	105,63
47	106,17	106,71	107,25	107,79	108,33	108,89	109,44	109,99	110,55	111,11
48	111,67	112,23	112,80	113,37	113,93	114,51	115,08	115,65	116,24	116,83
49	117,41	118,00	118,59	119,17	119,79	120,37	120,99	121,57	122,19	122,80



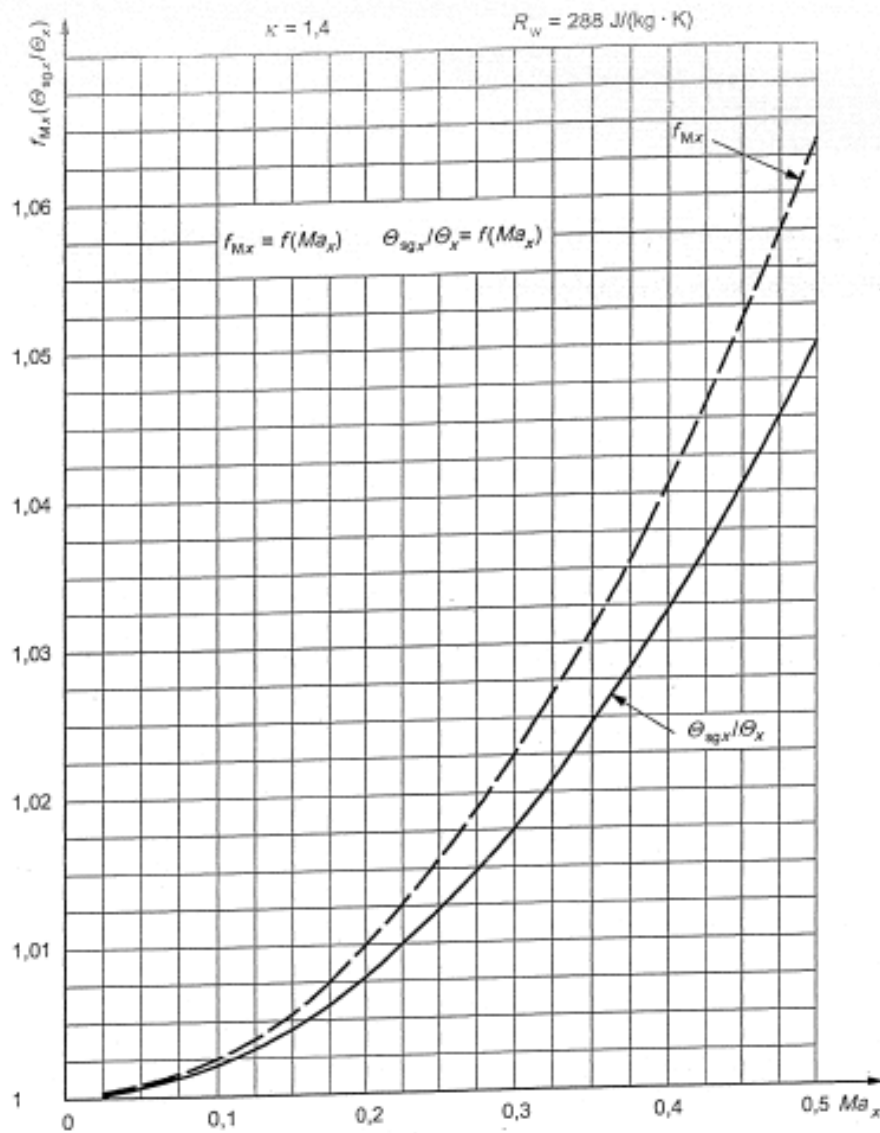
ANEXO 4

Cambio en Ma_x y la relación θ_{sgx}/θ_x como función de M^2



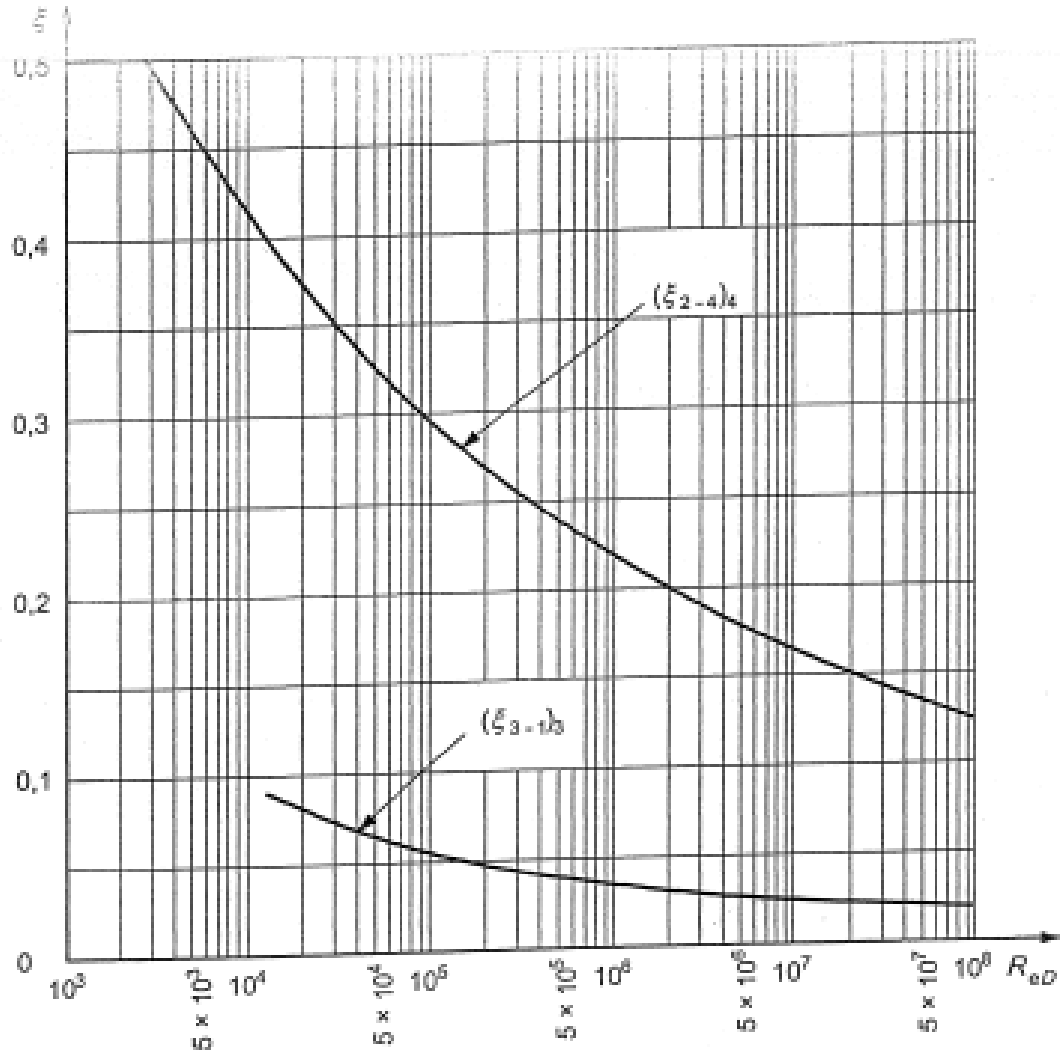
ANEXO 5

Cambios en f_{Mx} y la relación θ_{sgx}/θ_x como función de Ma_x



ANEXO 6

Coeficiente de pérdidas para conductos estandarizados







Estimado David:

Remito precio de loa materiales que comercializamos y contamos con stock:

ÁNGULO A-36 3/16" X 1 1/2" X 6 MTS. US\$ 13.66 (PZA) + IMPUESTOS

ÁNGULO A-36 3/16" X 2" X 6 MTS. US\$ 22.07 (PZA) + IMPUESTOS

*** DESPACHOS A PARTIR DE 1 TM.**

Atentamente,



IN TENEBRIS

Estimado David

Te envío lo solicitado

(04) Plancha Galvanizada de 1.90 x 1200 x 2400 mm	US\$	47.82
(03) Angulo de 3/16" x 1 1/2" x 6 mt		14.00
(01) Angulo de 3/16" x 2" x 6 mt		19.90

MAS I G V		
25 Kg Soldadura Punto Azul de 1/8"	S/.	9.50

MAS I G V

Saludos

Alberto Ramirez Polack

619-3000 anex. 208

Rpc 989251199



COTIZACION

LIMA, 24 DE JUNIO DEL 2010

FTRA-VEH-24

SEÑORES:

INTERMEDIO DE LA PRESENTE, NOS ES GRATO HACERLES LLEGAR NUESTRA COTIZACION DE MATERIALES:

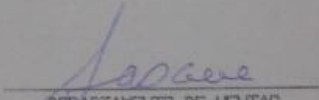
CODIGO	DESCRIPCION	UNIDADES	PESO	P.UNIT	% DESC	TOTAL S/.
02.075	ANGULO 3/16" x 1.1/2" x 6 mt.	—1-PZ—	15	53.50	4.0 2.0	50.33
02.115	ANGULO 3/16" x 2" x 6 mt.	—1-PZ—	21	83.47	4.0 2.0	78.53
08.016	RED.LISO A-36 1" x 6 mt.	—1-PZ—	23	81.55		81.55
38.0552	PLANCHA GALV. 2.00 x 1200 x 2400	—1-PZ—	45	179.87	2.0 2.0	172.74
51.501	PUNTO AZUL E-6011 1/8" 01 Kg	KG—	1-	9.76	1.00	9.66
T O T A L E S		—4—	—105—			S/. 392.81

TRECIENTOS NOVENTIDOS Y 81/100 NUEVOS SOLES

CONDICIONES DE VENTA:

- LOS PRECIOS INCLUYEN IGV (19.00%).
- LOS PRECIOS ESTAN SUJETOS A MODIFICACION SIN PREVIO AVISO.
- NO SE INCLUYE EL COSTO DE TRANSPORTE.
- COTIZACION VALIDA POR ____ DIAS.

NO VERNOS FAVORECIDOS CON SUS GRATAS ORDENES, NOS SUSCRIBIMOS DE USTEDES.


 DEPARTAMENTO DE VENTAS





INDUSTRIAS Y SERVICIOS "EL TIGRE" S.A.

DIVISIÓN DE INGENIERIA EN VENTILACION SUBTERRANEA
SECTOR INDUSTRIAS

Lima, 21 de Junio de 2010

Señores:
**UNIVERSIDAD CATOLICA DEL PERU
SAN MIGUEL**

Att. : **ING. DAVID ENRIQUEZ** (Ing. Mecánico)

Ref : **Cotización 0403 / 2010** (Conexión Semirígida Rack Espiralduct® de 500 mm de Ø
Conexión Flexible Rack Ventiduct® de 500 mm de Ø "EL TIGRE")

Estimados señores:

Tenemos el agrado de dirigirnos a Uds., con la finalidad de hacerles llegar nuestra mejor oferta con relación a su **Solicitud de Precios** :

CONEXIONES CON ABRAZADERAS DE BANDA PLANA DE PVC (TIPO RACK) " EL TIGRE "

Item No. 1 : CONEXIÓN SEMIRÍGIDA RACK ESPIRALDUCT® PARA DUCTERIA RÍGIDA CON ABRAZADERA (TIPO RACK) CON SEGURO DE BANDA PLANA DE PVC "EL TIGRE"

Estas Conexiones son ideales para unir Ducteria. Se caracterizan por una fabricación de acero recubierta de zinc, una asa de rápida liberación y tres adaptaciones para variar el espesor. Las abrazaderas de Banda Plana son empleados con tubería de VENTIDUCT®, ESPIRALDUCT®, TIGRE OVAL®, TIGRE-ELIPSE®, TIGRETWIN®, TRIDUCTO®DUCT® Y RIGIDUCTO.

**CONEXIÓN SEMIRÍGIDA RACK
ESPIRALDUCT®
"EL TIGRE"**



Abrazadera de Banda Plana de PVC (" RACK ")

En Proceso de Acople con el otro extremo
que contiene una Terminación Rígida de
Espiralduct con RACK

INDUSTRIAS Y SERVICIOS " EL TIGRE " S.A.

Fábrica Principal : Av. Gerardo Unger Mza. B Lote 5B Urb. Los Claveles de Pro- Zona Industrial
Distrito de San Martín de Porras Código Postal LIMA 31 LIMA - PERU
Teléfono : (51) (1) 536 4526 // 537 3516 // 719 5630
Fax : (51) (1) 536 3757
E-mail : rah@iys-el-tigre.com
Web Site : www.iys-el-tigre.com



INDUSTRIAS Y SERVICIOS "EL TIGRE" S.A.

DIVISIÓN DE INGENIERIA EN VENTILACION SUBTERRANEA
SECTOR INDUSTRIAS

Item No. 2 : CONEXIÓN FLEXIBLE RACK-VENTIDUCT® PARA DUCTERIA RIGIDA CON ABRAZADERA (TIPO RACK) CON SEGURO DE BANDA PLANA DE PVC "EL TIGRE"

Estas Conexiones son ideales para unir Ducteria. Se caracterizan por una fabricación de acero recubierta de zinc, una asa de rápida liberación y tres adaptaciones para variar el espesor. Las abrazaderas de Banda Plana son empleados con tubería de VENTIDUCT®, ESPIRALDUCT®, TIGRE OVAL®, TIGRE-ELIPSE®, TIGRETWIN®, TRIDUCTO®DUCT® Y RIGIDUCTO.

**CONEXIÓN FLEXIBLE RACK
VENTIDUCT®
"EL TIGRE"**



INDUSTRIAS Y SERVICIOS " EL TIGRE " S.A.

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INDUSTRIAS Y SERVICIOS "EL TIGRE" S.A.

DIVISIÓN DE INGENIERIA EN VENTILACION SUBTERRANEA
SECTOR INDUSTRIAS

RESUMEN DE PRECIOS

CONEXION SEMIRIGIDA RACK ESPIRALDUCT® "EL TIGRE"

<u>MATERIAL</u>	<u>ABRAZADERAS+ESPIRALDUCT®</u> 500 mm de Ø (01 pza)
CONEXIÓN SEMIRIGIDA RACK ESPIRALDUCT® (RACK + ESPIRALDUCT® DE 50 CMS) <u>Material :</u> Tigrelona® Rip Stop JL-600 FR Espesor : 0.75 mm Peso : 600 g/m2	US\$. 300.00 x pza + IGV

CONEXION FLEXIBLE RACK VENTIDUCT® "EL TIGRE"

<u>MATERIAL</u>	<u>ABRAZADERAS+VENTIDUCT®</u> 500 mm de Ø (01 pza)
CONEXIÓN FLEXIBLE RACK VENTIDUCT® (RACK + VENTIDUCT® DE 50 CMS) <u>Material :</u> Tigrelona® Rip Stop JL-600 FR Espesor : 0.75 mm Peso : 600 g/m2	U.S.\$ 200.00 x pza + IGV

INDUSTRIAS Y SERVICIOS " EL TIGRE " S.A.

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INDUSTRIAS Y SERVICIOS "EL TIGRE" S.A.

DIVISIÓN DE INGENIERIA EN VENTILACION SUBTERRANEA
SECTOR INDUSTRIAS

Impuesto : Adicionar 19 % I.G.V.

Entrega : **07 DIAS UTILES**

F. Pago : **100 % ADELANTADO**

Bank : BBVA BANCO CONTINENTAL
Swift Code : BCONPEPL
Account Number : **0011-0382-01-00005407-90** (Cuenta Corriente en U.S.\$.)
Beneficiary : **INDUSTRIAS Y SERVICIOS " EL TIGRE " S.A.**
Teléfono del Banco : (51) (1) 311 0288
Sectorista del Banco : Sr. Carlos Fiestas Correa

Nombre del Banco : **SCOTIABANK**
Numero de cuenta bancaria en Dólares : 000-3278967
Codigo swift : **BSUDPEPL**
Dirección : Av. Perú 3460-San Martín de Porres
Teléfono : (51)(1) 568-3235
Telefax : (51) (1) 5670057
Sectorista : Sr. Alex Flores Díaz
E-mail : alex.flores@scotiabank.com.pe

Garantías de los Accesorios

Garantizamos la calidad de nuestros productos durante el **periodo de 01 año** a partir de la puesta en marcha, y como máximo 18 meses desde el aviso de disponibilidad de los materiales, lo que antes suceda.

Se excluye de esta garantía todas aquellas partes y piezas que están afectas a desgaste natural por uso. Los productos que hayan sido utilizados inadecuadamente, manipulados incorrectamente, impropriamente instalados, conectados a tensiones **distintas de lo recomendado**, modificados o reparados por personal no autorizado, ó que hayan sufrido daños durante el transporte, **por mala manipulación del usuario** quedan excluidos de toda garantía. La garantía se hace efectiva en nuestra fábrica matriz en Lima-Perú, ó a través de nuestra red de representantes en el mundo.

Validez : **15 días.**

INDUSTRIAS Y SERVICIOS " EL TIGRE " S.A.

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INDUSTRIAS Y SERVICIOS "EL TIGRE" S.A.

DIVISIÓN DE INGENIERIA EN VENTILACION SUBTERRANEA
SECTOR INDUSTRIAS

Agradeciendo anticipadamente la atención que le presten a la presente, y en espera de sus gratas órdenes, queda de Uds.

Atentamente.

ING ° ROLANDO AMASIFUEN H.

Vice-Presidente

E-mail : rah@iys-el-tigre.com

Cell Phone : (51) (1) 98564 4542 - Perú

(51) (1) 99180 2530 - Perú

(56) (9) 7460 6641 - Chile

(57) 3202707783 - Colombia

ING. ANDRES BRAVO ORMACHEA

Dpto. de Ingeniería - Comercialización

Email : jgv@iys-el-tigre.com

Teléfono : (51) (1) 536 4526 Anexo 115

Fax : (51) (1) 536 3657



INDUSTRIAS Y SERVICIOS " EL TIGRE " S.A.

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BIS Aero[®]

para conductos de aire Ø 80 - 1.250 mm

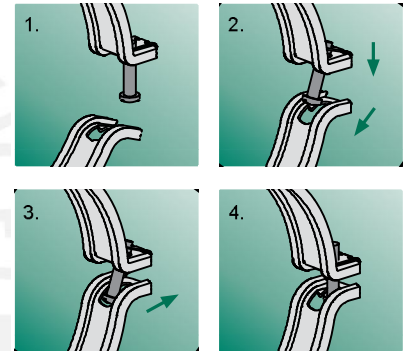
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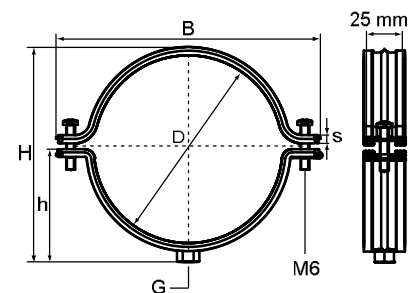


Características y ventajas

- con sistema de cierre rápido
- la goma está unida a la abrazadera (permanece adherida cuando se desliza el conducto de aire)
- material: abrazadera para tubería fabricada en acero, pre-galvanizada
- revestimiento aislante de ruido, goma de TPE, negro

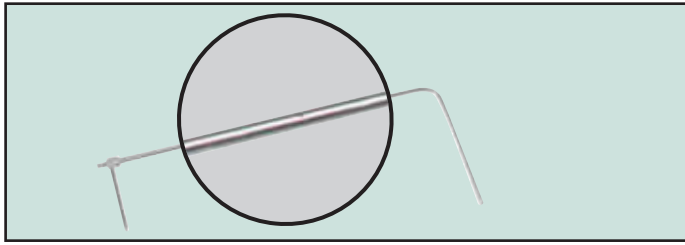


Pieza N°	D (mm)	G	B (mm)	H (mm)	h (mm)	s (mm)	Fa,z (N)	U.m.v.1
411 5 080	80	M8	134	84	54	1,25	700	25
411 5 100	100	M8	155	115	64	1,25	700	25
411 5 125	125	M8	179	139	76	1,25	700	20
411 5 140	140	M8	197	162	85	1,25	720	20
411 5 150	150	M8	205	164	88	1,25	720	20
411 5 160	160	M8	215	175	93	1,25	720	20
411 5 180	180	M8	238	202	105	1,25	720	20
411 5 200	200	M8	255	215	114	1,25	720	20
411 5 250	250	M8	306	265	138	1,25	720	20
411 5 315	315	M8	371	332	172	1,25	720	25
411 5 355	355	M8	411	371	192	1,25	720	25
411 5 400	400	M8	456	416	214	1,25	720	20
411 5 450	450	M8/10	524	481	238	2,00	1.150	3
411 5 500	500	M8/10	574	531	263	2,00	1.150	3
411 5 560	560	M8/10	634	591	293	2,00	1.150	3
411 5 600	600	M8/10	674	632	313	2,00	1.150	3
411 5 630	630	M8/10	705	669	338	2,00	1.150	3
411 5 710	710	-	785	732	366	2,00	1.150	3
411 5 800	800	-	875	817	409	2,00	1.150	3
411 5 900	900	-	975	917	459	2,00	1.150	3
411 5 999	1.000	-	1.076	1.018	509	2,00	1.150	3
411 5 997	1.120	-	1.196	1.138	569	2,00	1.150	3
411 5 998	1.250	-	1.326	1.268	634	2,00	1.150	3



D ≥ 450 mm cierre: 2 tornillos de cabeza hexagonal con tuerca / D ≥ 710 mm sin tuerca de conexión.

La max. carga recomendada (Fa,z) está calculada usando métodos estadísticos específicos relacionados con la carga de rotura, teniendo en consideración una deflexión de 1,5 mm o 2 % del diámetro máximo de la abrazadera.



Standard Model 160 Pitot Tube

Ideal for use with our precision manometers and air velocity gages, Dwyer® Pitot Tubes are constructed from corrosion resistant stainless steel for a lifetime of service. ASME design meets AMCA and ASHRAE specifications for maximum accuracy over a wide variety of flow conditions. No correction factors required as ASHRAE tip design yields a calibration factor of 1. ASHRAE design needs no calibration! Permanent, stamped insertion depth graduations on sides of 160 series facilitate accurate positioning. Static pressure port is parallel to sensing tube allowing quick, easy alignment of tube with air flow. Low sensitivity to misalignment gives accurate reading even when tube is misaligned up to 15 degrees. Various standard sizes are available for use in ducts as small as 4" dia. or as large as 36 ft. dia. A universal model fits user supplied 3/4" schedule 40 (standard) pipe in any length. Several convenient mounting options are available for permanent installations.

- No calibration needed.
- Precisely located, burr-free static pressure holes.
- Hemispherical tip design, best for accuracy if imperfectly aligned and nearly impossible to damage.
- Long lasting 304 SS construction.
- Silver soldered connections for leak-proof operation.
- Coefficient of "1."
- 5/16" models rated to 1500°F.
- Extended static connection helps guide tip within recommended 15° of air flow direction.
- Inch graduations on sides of 160 series to quickly determine exact insertion depth.
- Dwyer® Air Velocity Calculator, direct reading flow charts and instructions included.
- Use 1/8" models in ducts as small as 4", 5/16" models in ducts 10" or larger.
- Optional mounting gland or split flange make permanent installation fast and simple.

- Series 160 is designed to meet:
- ASME "Fluid Meters" 6th Ed.
 - ANSI/AMCA 210-99
 - ANSI/ASHRAE 51-1999
 - British Standard 1042



A-158 Split Flange Mounting

ACCESSORIES

No. A-158 Split Flange Mounting can be added to any Dwyer® No. 160 Standard Pitot Tube. Cadmium plated steel. Gasket is pattern for mounting holes. Secure flange loosely to tube, adjust tube depth and tighten screws. Gasket of 1/4" Neoprene fits tightly around tube and against duct for leak-proof seal. Nuts, washers included.

No. A-159 Mounting Gland — No. A-159 Mounting Gland — Versatile adapter slips on any Series 160, 5/16" standard Pitot tube made after Dec. 1990. Two-part stainless steel fitting slides over tube and provides permanent, secure mounting. Where duct interior is accessible, use the washers and jam nut supplied. For blind applications or in thicker materials, use model A-156 flange mounting plate. Once tube is adjusted to proper depth and angle, tighten smaller hex bushing to lock position. Graphite bushing inside assures leak-proof seal even at higher temperatures. TUBE bushing also available. **NOTE:** For full insertion with this fitting, order next longer Pitot tube.

A-159 Mounting Gland is used for both duct mounting and flange mounting. To flange mount, the A-159 must be used with the A-156 flange mounting plate.

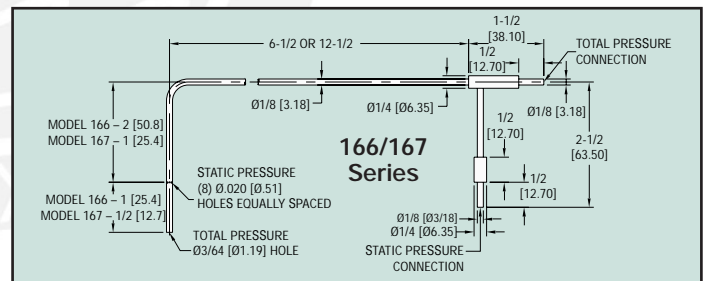
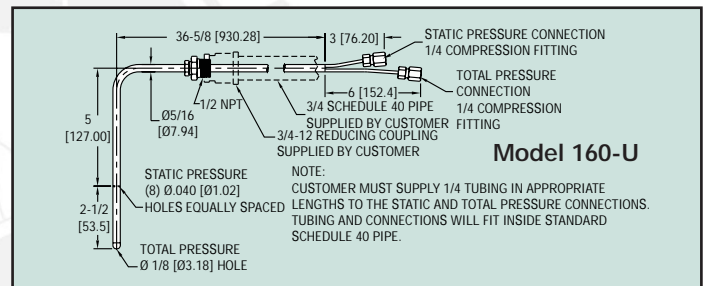
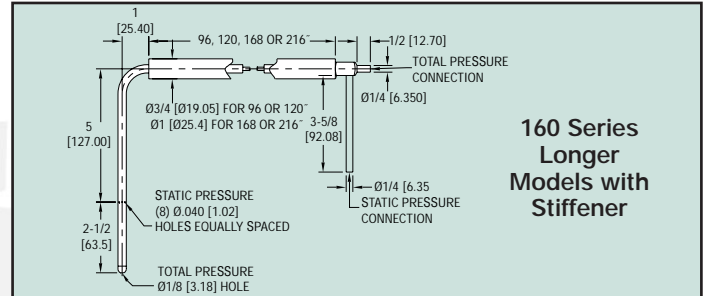
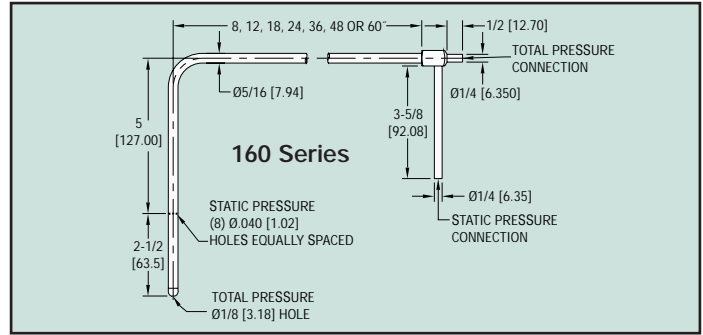


A-159 Duct Mounting Gland with 1/2" male NPT A-156 Flange Mounting Plate with 1/2" female NPT



A-397 Step Drill

No. A-397 Step Drill. For fast, convenient installation of Pitot tubes in sheet metal ducts. No center punch needed; automatic de-burring. Drills six sizes from 3/16" to 1/2" in 1/16" increments.



MODELS

Standard 3/8" Dia.		Longer Length w/ Stiffener	
Model Number	Insertion Length	Model Number	Insertion Length
160-8	8"	160-96	96"
160-12	12"	160-120	120"
160-18	18"	160-168	168"
160-24	24"	160-216	216"
160-36	36"	Pocket Size 1/8" Dia.	
160-48	48"	166-6	6"
160-60	60"	166-12	12"
Universal Model for 3/4" Pipe		167-6	6"
160-U	*	167-12	12"

Accessories & Options	
A-156 Flange Mounting Plate 1/2" female NPT A-158 Split Flange A-159 Mounting Gland A-397 Step Drill	Compression Fitting mounting option for 166/167 Series. Add -CF suffix (166-6-CF). Add to prices above

*Universal model for permanent installation and connection to metal tubing. Make any length Pitot tube with 3/4" schedule 40 pipe, 3/8" to 1/2" reducing bushing and 1/4" metal tubing.

See also: Ellipsoidal "S" Type Pitot Tubes - page 224

M420 Rotary Torque Transducers

Accurate • Easy to Use • Reliable & Robust

Ranges from 0-10Nm up to 0-60,000Nm

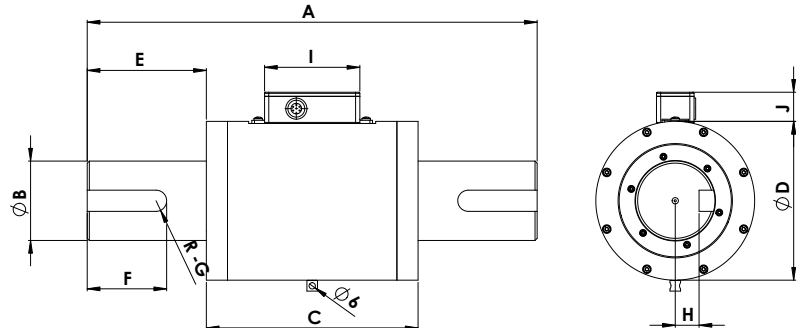
Datum Electronics M420 Rotary Torque Transducers measure the speed and torque strain in a rotating shaft. Signal output is transmitted directly from the shaft as serial data. The data can then be processed by a control system, logging system or a PC (through a USB converter if required) or by one of Datum's torque indicators. Whatever the instrumentation, Series 420 transducers are designed to provide you with highly stable, noise immune, easily accessible and accurate data.



The range is available in 6 body sizes. To help meet individual requirements from stock, a number of intermediate torque ranges are offered with each body size - starting from 0-10Nm to 0-100Nm on Size 1, rising to 0-15,000Nm and 0-20,000Nm on Size 5. The bespoke Size 6 offers a range of 0- 60,000Nm (details on request).

The M420 Series is currently used in over 50 countries throughout the world. Accurate, reliable and competitively priced and resistant to oil, grease, dust, etc., it is an ideal solution for most general test rig applications.

Datum Electronics is a leader in the design and manufacture of torque and power measurement products and systems. The M420 Series is one of a number of standard solutions available, the company also manufacture modular and custom solutions and are always please to discuss these options with you.



M420 Series Specifications	
Accuracy (combined non-linearity hysteresis)	+/- 0.1%
Repeatability	+/- 0.05%
Mechanical Overload	150% rated load (200% to order)
Operating Temperature Range	0 to 75C
Compensated Temperature Range	15 to 50C
Temperature Effect on Zero	+/- 0.0035% per deg C
Temperature Effect on Span	+/- 0.0035% per deg C
Supply Voltage	12Vdc
Output	RS232 Serial Data
Analogue Output Options (for torque and speed if selected)	+/- 10Vdc +/- 5Vdc 4-20mA 12mA+/-8mA
Speed Output Option	1 ppr as rpm within serial data

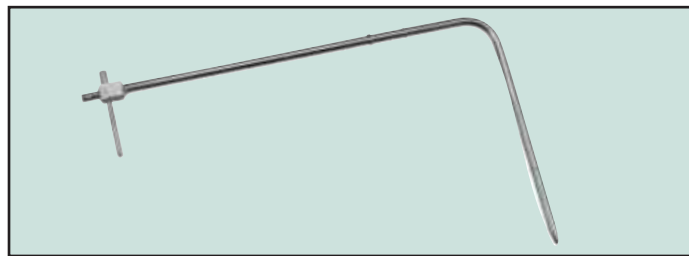
	M420 S1-A	M420 S1-B	M420 S1-C	M420 S1-D	M420 S2-A	M420 S2-B	M420 S3-A	M420 S3-B	M420 S4-A	M420 S4-B	M420 S5-A	M420 S5-B
Nm	10	25	50	100	250	500	1000	2000	5000	10000	15000	20000
Rating Lbft	7.4	18.4	36.9	73.8	184.4	368.8	737.6	1475.1	3687.8	7375.6	11063.4	14751.2
Std max RPM	10000	10000	10000	10000	8000	8000	4000	4000	3000	3000	2500	2500
HS max RPM	18000	18000	18000	18000	12000	12000	8000	8000	4500	4500	3500	3500
Weight Kgs	0.91	0.91	0.91	0.91	2.44	2.44	6.7	6.7	20.3	20.3	34.0	34.0
A Overall Length	184	184	184	184	240	240	315	315	425	425	415	415
B Shaft Diam g6 fit	15	15	15	15	30	30	50	50	75	75	110	110
C Body Length	129	129	129	129	150	150	147	147	200	200	175	175
D Body Diam	60	60	60	60	85	85	105	105	150	150	170	170
E Exposed Shaft Length	27.5	27.5	27.5	27.5	45	45	84	84	112	112	120	120
F Keyway Length	22.5	22.5	22.5	22.5	44	44	78.5	78.5	75	75	32	32
G Keyway Width	5	5	5	5	8	8	12	12	20	20	18	18
H Keyway Depth off centre	4.3	4.3	4.3	4.3	11	11	20	20	30	30	44	44
I Output Module Length	note 1	note 1	note 1	note 1	90	90	90	90	90	90	90	90
J Output Module Height	note 1	note 1	note 1	note 1	26	26	26	26	26	26	26	26

Ellipsoidal Tip Pitot Tube

Designed to Meet British Standard 1042

- Ellipsoidal tip design for improved accuracy, 1.0 coefficient
- 304 SS construction adds strength, resists corrosion
- Adjustable depth indicators for fast, consistent traverses
- Alignment indicator helps keep tip parallel to flow

Series 160E Pitot Tubes are widely used in the U.K. and Europe for applications demanding high accuracy when measuring the flow of air or other compatible gases. Precision crafted tip configuration allows air to pass smoothly with minimum turbulence for consistent, reliable readings. Exterior indicator arm is aligned parallel to the 5 in. (13 cm) sensing tip so you always know that unit is properly positioned inside duct. Sliding depth indicators grip firmly to ensure uniform insertion – critical when making multiple measurements as part of a complete traverse; the best way to determine average velocity. Total and static pressure taps are 1/8" (6 mm), permanently silver soldered to the connection block, leak-proof and durable. Seven fixed length sizes are offered plus a universal model which attaches to any length of 1/2" sch. 40 pipe. See 160-U drawing.



MODELS

Model Number	Insertion in Meters
160E-00	0.2
160E-01	0.3
160E-02	0.48
160E-03	0.8
160E-04	1.0
160E-05	1.22
160E-06	1.52
160E-U	



Handy A-532 Slide Chart speeds air velocity calculations. All plastic, stays clean for years. Included with each Pitot tube.

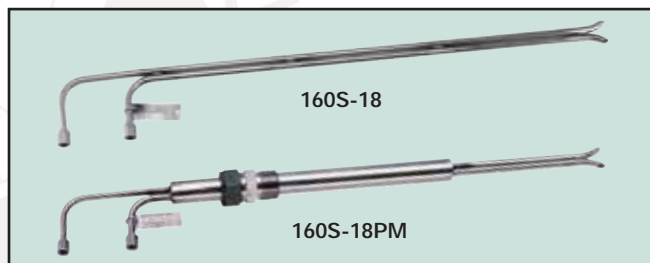


"S" Type Stainless Steel Pitot Tubes

Large, Open Tip Design Resists Fouling; Optional Permanent Mount Models

- Meets EPA specification 40 CFR (ch. 1)
- Long lasting, welded stainless steel construction
- 1/2" female NPT connections, permanently welded
- Rated to 1500°F (815°C)
- 0.84 flow coefficient

Series 160S Pitot Tubes are designed specifically for flow measurement of dirty, particulate laden air or gas streams typical in smoke stack and other environmental testing. Large 3/8" dia. stainless steel tubing resists plugging under harsh, sooty conditions which quickly block conventional flow sensors. Total and static pressure tubes are precisely aligned and welded together every six inches for maximum accuracy, strength and long term durability. Versatile 1/2" female NPT connections easily adapt to any type of pipe or tubing. A pair of 1/8" NPT to 3/8" I.D. tubing adapters is included plus a handy molded vinyl cap to protect tip when not in use. Supplied with complete instructions.



MODELS

Model Number	Perm. Mtg. Model No.	Insertion In Inches
160S-18	160S-18PM	18
160S-24	160S-24PM	24
160S-36	160S-36PM	36
160S-48	160S-48PM	48
160S-60	160S-60PM	60
160S-72	160S-72PM	72

Permanent Mounting (PM) models include 1 inch dia. welded stainless steel sleeve and adjustable compression fitting with 1 inch male NPT mounting treads. Adjust depth, lock in place.



Telescoping Stainless Steel Pitot Tube

Adjustable Design Extends Insertion Length to 36 Inches

The **Model 166T Telescoping Pitot tube** is a unique air flow sensor which can quickly and easily be adjusted for any duct insertion length from 11.5 to 36 inches (29.2 to 91.4 cm). Now, this single compact unit can replace up to five conventional fixed length Pitot tubes. For even greater convenience, it is securely protected by a custom fitted polyethylene carrying case. Telescoping sections lock in place as they are extended, enabling use of the handle grip to gauge proper alignment of the tip within the airstream. Stainless steel construction resists corrosion. Hemispherical tip has 1.0 flow coefficient, is 1/8" dia. (3.2 mm). Largest section is 3/8" (9.5 mm). Weight (with case) 1 lb, 9 oz (709 g). Case: 12.5 x 6.25 x 3.175 in.



Model 166T



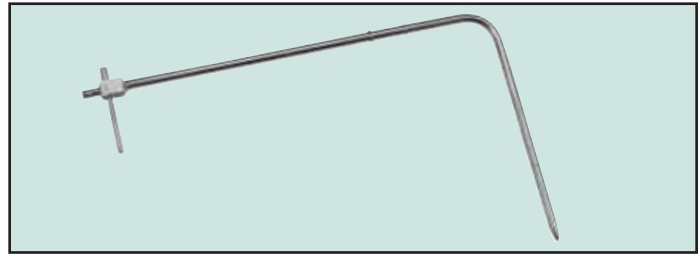
Ellipsoidal Tip Pitot Tube

Designed to Meet British Standard 1042



- Ellipsoidal tip design for improved accuracy, 1.0 coefficient
- 304 SS construction adds strength, resists corrosion
- Adjustable depth indicators for fast, consistent traverses
- Alignment indicator helps keep tip parallel to flow

Series 160E Pitot Tubes are widely used in the U.K. and Europe for applications demanding high accuracy when measuring the flow of air or other compatible gases. Precision crafted tip configuration allows air to pass smoothly with minimum turbulence for consistent, reliable readings. Exterior indicator arm is aligned parallel to the 5 in. (13 cm) sensing tip so you always know that unit is properly positioned inside duct. Sliding depth indicators grip firmly to ensure uniform insertion – critical when making multiple measurements as part of a complete traverse; the best way to determine average velocity. Total and static pressure taps are 1/4" (6 mm), permanently silver soldered to the connection block, leak-proof and durable. Seven fixed length sizes are offered plus a universal model which attaches to any length of 3/4" sch. 40 pipe. See 160-U drawing.



Model Number	Insertion in Meters
160E-00	0.2
160E-01	0.3
160E-02	0.48
160E-03	0.8
160E-04	1.0
160E-05	1.22
160E-06	1.52
160E-U	



Handy A-532 Slide Chart speeds air velocity calculations. All plastic, stays clean for years. Included with each Pitot tube.

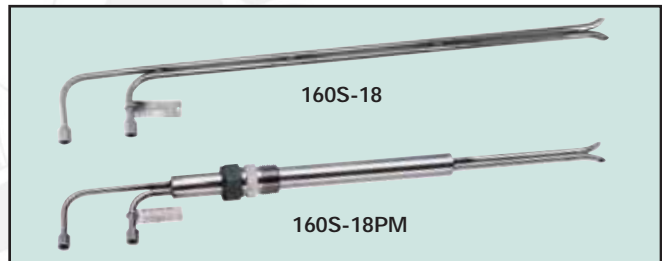


"S" Type Stainless Steel Pitot Tubes

Large, Open Tip Design Resists Fouling; Optional Permanent Mount Models

- Meets EPA specification 40 CFR (ch. 1)
- Long lasting, welded stainless steel construction
- 1/8" female NPT connections, permanently welded
- Rated to 1500°F (815°C)
- Rated to 100 psig (6.89 bar)
- 0.84 flow coefficient

Series 160S Pitot Tubes are designed specifically for flow measurement of dirty, particulate laden air or gas streams typical in smoke stack and other environmental testing. Large 5/16" dia. stainless steel tubing resists plugging under harsh, sooty conditions which quickly block conventional flow sensors. Total and static pressure tubes are precisely aligned and welded together every six inches for maximum accuracy, strength and long term durability. Versatile 1/8" female NPT connections easily adapt to any type of pipe or tubing. A pair of 1/8" NPT to 3/16" I.D. tubing adapters is included plus a handy molded vinyl cap to protect tip when not in use. Supplied with complete instructions.



Model Number	Perm. Mtg. Model No.	Insertion In Inches
160S-18	160S-18PM	18
160S-24	160S-24PM	24
160S-36	160S-36PM	36
160S-48	160S-48PM	48
160S-60	160S-60PM	60
160S-72	160S-72PM	72

Permanent Mounting (PM) models include 1 inch dia. welded stainless steel sleeve and adjustable compression fitting with 1 inch male NPT mounting treads. Adjust depth, lock in place.



Telescoping Stainless Steel Pitot Tube

Adjustable Design Extends Insertion Length to 36 Inches

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Model 166T

Amortiguador Cónico - Silentblock - Serie A - A-70

Amortiguador Cónico - Silentblock. Serie A.

Imagen

Ficha Técnica

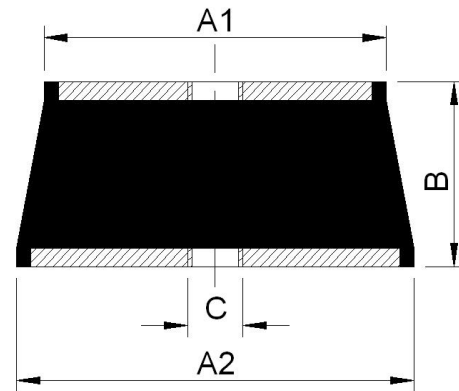


- - Dureza 60 Shore
- Carga Kgs. 150 - 250
- C: M-12
- A1: 70 mm.
- A2: 80 mm.
- B: 58 mm.

Gráfica

Dibujo

Imagen
de Muestra



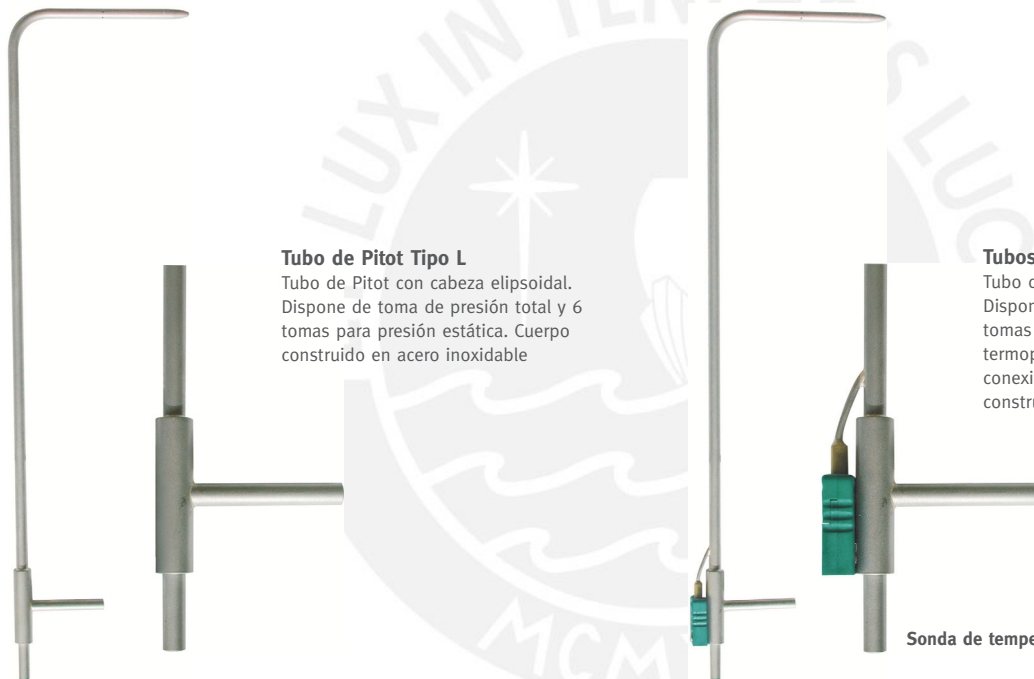
FICHA DE DATOS TÉCNICOS

TUBOS DE PITOT TIPO L



KIMO dispone de un amplio rango de tubos de Pitot de alta calidad y precisión, fabricados según normativa ISO 3966. Estos tubos de Pitot al conectarse a un manómetro de columna de líquido / o aguja / o manómetro electrónico, puede medir las presiones totales, estáticas y dinámicas de un fluido en conducto. A partir de estas medidas podemos deducir la velocidad en m/s y sabiendo la superficie encontramos su caudal en m³/h.

Estos tubos de Pitot se usan en el campo del HVAC, limpiezas por aspiraciones, transporte neumático... Su principal campo de aplicación radica en las medidas cuando el aire es caliente, va cargado de partículas o cuando las velocidades son muy altas, entre otras aplicaciones.



Tubo de Pitot Tipo L
Tubo de Pitot con cabeza elipsoidal. Dispone de toma de presión total y 6 tomas para presión estática. Cuerpo construido en acero inoxidable

Tubos de Pitot Tipo L con TC K
Tubo de Pitot con cabeza elipsoidal. Dispone de toma de presión total y 6 tomas para presión estática. Sonda termopar K integrada, y con cable de conexión de longitud 1,5 m. Cuerpo construido en acero inoxidable.

Sonda de temperatura integrada

	Tipo L	Tipo L con TC K
Norma	AFNOR NFX10-112. Anexo 4 fecha 14.9.77. Esta norma cumple con los requisitos de la norma internacional ISO 3966.	
Modelo	Curva NPL con cabeza elipsoidal	
Coefficiente	1,0015	
Precisión	Mejor del 1 %, para una alineación de ± 10° al flujo a medir.	
Calidad	Acero inoxidable 4/4, según AFNOR / Z2.CDN.17.12.	
Temperatura en uso	De 0 a 600°C el equipo standard y hasta 1.000°C opcional (excepto Ø 3 mm).	
	El error acumulado en la medida de velocidad o caudal con un tubo de Pitot KIMO es inferior al 2%, cuando la medida se efectua según las especificaciones en la norma NFX10-112.	
	Se recomienda efectuar una calibración del tubo de Pitot para determinar su coeficiente exacto.	

PRESENTACIÓN DE EQUIPOS

Tubos de pitot Tipo L

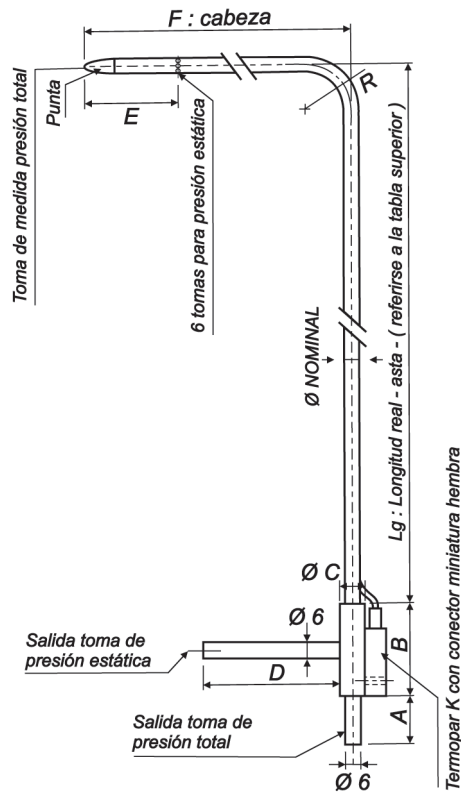
	Referencia	Longitud
Ø 3 mm	TPL-03-100	100 mm
	TPL-03-200	200 mm
	TPL-03-300	300 mm
Ø 6 mm	TPL-06-300	300 mm
	TPL-06-500	500 mm
	TPL-06-800	800 mm
Ø 8 mm	TPL-08-1000	1000 mm
	TPL-08-1250	1250 mm
Ø 12 mm	TPL-12-1500	1500 mm
	TPL-12-2000	2000 mm
Ø 14 mm	TPL-14-2500	2500 mm
	TPL-14-3000	3000 mm

Tubos de pitot Tipo L con TCK

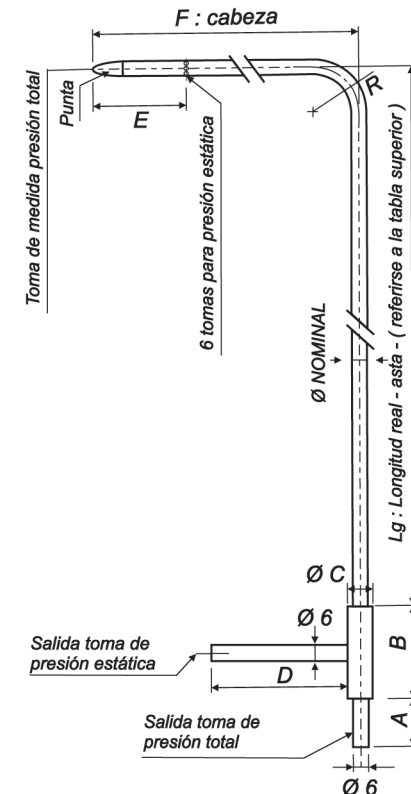
	Referencia	Longitud
Ø 3 mm	TPL-03-100-T	100 mm
	TPL-03-200-T	200 mm
	TPL-03-300-T	300 mm
Ø 6 mm	TPL-06-300-T	300 mm
	TPL-06-500-T	500 mm
	TPL-06-800-T	800 mm
Ø 8 mm	TPL-08-1000-T	1000 mm
	TPL-08-1250-T	1250 mm
Ø 12 mm	TPL-12-1500-T	1500 mm
	TPL-12-2000-T	2000 mm
Ø 14 mm	TPL-14-2500-T	2500 mm
	TPL-14-3000-T	3000 mm

DESCRIPCIÓN Y DIMENSIONES

Tubos de pitot Tipo L



Tubos de pitot Tipo L con TCK



	a	b	c	d	e	f	r
Tubos de pitot Ø 3 mm	17	32	10	30	25	48	9
Tubos de pitot Ø 6 mm	25	40	10	45	48	96	18
Tubos de pitot Ø 8 mm	25	40	10	45	64	128	24
Tubos de pitot Ø 12 mm	25	40	16	60	96	192	36
Tubos de pitot Ø 14 mm	25	50	16	60	112	224	42

CARACTERÍSTICAS TÉCNICAS

El tubo de Pitot debe introducirse perpendicular en el conducto, y tomar varios puntos de medida predeterminados (ver tabla "Puntos de medida").

La punta (extremo con cabeza elipsoidal) debe mantenerse paralelo apuntando al flujo.

La presión total (+) tomada en la punta, debe conectarse al + del manómetro

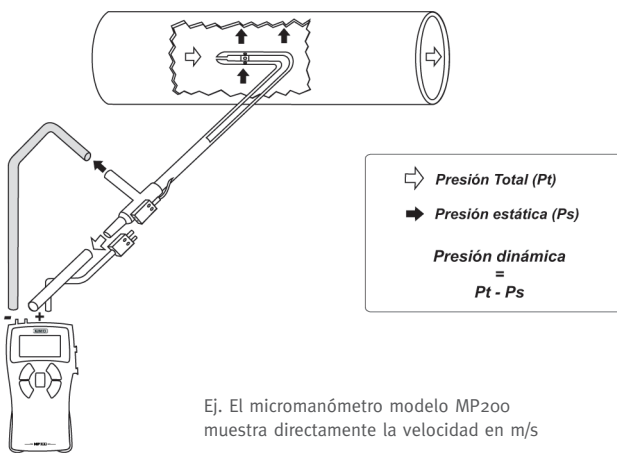
La presión estática (-) tomada por los puntos de la cabeza, debe conectarse al - del manómetro.

El cable de conexión del termopar K debe conectarse a la entrada para sonda termopares K de los termómetros (sólo en tubos de Pitot tipo L con TC K).

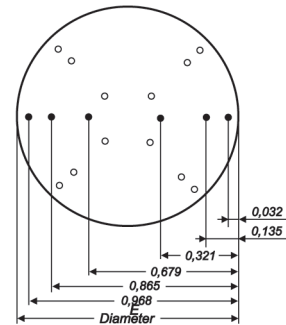
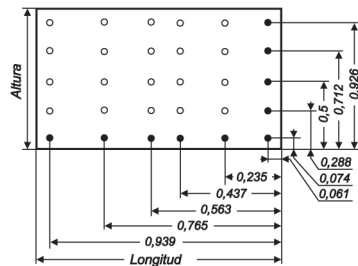
En estos momentos el equipo esta mostrando la presión dinámica, que es proporcional a la velocidad.

La presión dinámica corresponde a la diferencia entre presión total y la estática: $P_d = P_t - P_s$

Los tubos de Pitot tipo L con TC K: permiten una lectura directa de la velocidad con o sin compensación de temperatura en los micromanómetros de las series 200 y 300.



Puntos de medida



Esquema simplificado de la norma NF.X10.112, para puntos de medida, según metodo "Log.Tchebycheff".

Con la presión dinámica en mm H₂O o en Pa, podemos calcular la velocidad del aire en m/s, con la fórmula simplificada de BERNOULLI:

$$V \text{ en m/s a } 20^{\circ}\text{C: } 1,291 \sqrt{P_d \text{ en Pa}}$$

ó

$$V \text{ en m/s : } 4,05 \sqrt{\Delta P \text{ en mmca}}$$

Formula para obtener la velocidad, con compensación en temperatura

$$V \text{ en m/s} = K \times \sqrt{\frac{574,2 \theta + 156842,77}{P_0}} \times \sqrt{\Delta P \text{ en Pa}}$$

P₀ Presión barométrica

θ temperatura en °C

K coeficiente del tubo de Pitot

OPCIONAL

Soldadura TIG

Esta opción esta recomendada cuando se usan los tubos de Pitot tipos L o L con TC K van a ser usados con temperaturas hasta 1000°C, esta opción no está disponibles para tubos de Pitot Ø 3mm.

ACCESORIOS

Racores de fijación en níquel

Para instalación fija de los tubos de Pitot.

- Ref: PE 458 Ø 3
PE 458 Ø 6
PE 458 Ø 8



Racores de fijación en inoxidable o hierro

- Ref: KI-BF-6 Acero inoxidable para tubos de Pitot Ø 3 y 6 mm.
KI-BF-8 Acero inoxidable para tubos de Pitot Ø 8 mm.
KI-BF-12-F Hierro fundido para tubo de Pitot Ø 12 mm.
KI-BF-14-F Hierro fundido para tubo de Pitot Ø 14 mm.



Racor corredero con rosca de fijación, fabricado en inoxidable y teflón

- Ref: KI-RCC-3/14 Racor corredero rosca cilíndrica 1/4 gas fijación en inoxidable para sondas de temperatura o Tubos de Pitot Ø 3 mm.
KI-RCCT-3/14 Racor corredero rosca cilíndrica 1/4 gas fijación en teflón para sondas de temperatura o Tubos de Pitot Ø 3 mm.
- Ref: KI-RCC-6/12 Racor corredero rosca cil. 1/2 gas fijación en inoxidable para sondas de temperatura o Tubos de Pitot Ø 6 mm.
KI-RCCT-6/12 Racor corredero rosca cil. 1/2 gas fijación en teflón para sondas de temperatura o Tubos de Pitot Ø 6 mm.
KI-RCC-8/12 Racor corredero rosca cil. 1/2 gas fijación en inoxidable para sondas de temperatura o Tubos de Pitot Ø 8 mm.
KI-RCCT-8/12 Racor corredero rosca cil. 1/2 gas fijación en teflón para sondas de temperatura o Tubos de Pitot Ø 8 mm.
KI-RCC-12/12 Racor corredero rosca cil. 1/2 gas fijación en inoxidable para sondas de temperatura o Tubos de Pitot Ø 12 mm.
KI-RCCT-12/12 Racor corredero rosca cil. 1/2 gas fijación en teflón para sondas de temperatura o Tubos de Pitot Ø 12 mm.
KI-RCC-14/12 Racor corredero rosca cil. 1/2 gas fijación en inoxidable para sondas de temperatura o Tubos de Pitot Ø 14 mm.
KI-RCCT-14/12 Racor corredero rosca cil. 1/2 gas fijación en teflón para sondas de temperatura o Tubos de Pitot Ø 14 mm.

Extensión de cable para termopar K clase 1

- Ref: CEK150M Longitud 1,50 m para sonda temperatura y tubo de Pitot, con conector miniatura macho/macho.
CEK150 Longitud 1,50 m para sonda temperatura con conector miniatura macho/hembra.
CEK300 Longitud 3 m para sonda temperatura con conector miniatura macho/hembra.
CEK500 Longitud 5 m para sonda temperatura con conector miniatura macho/hembra.

Tapones de plástico: suministrado en bolsas de 10 unidades

- Ref: 1590/12 Tapones de plástico, Ø 8 a 12 mm, altura 20 mm.
1590/17 Tapones de plástico, Ø 12 a 17 mm, altura 25 mm.
1590/22 Tapones de plástico, Ø 17 a 22 mm, altura 25 mm.

Tubos de Pitot rectos tipo L y tipo L con TC K

Puede tomar directamente sus medidas insertando este modelo en el conducto.

Diámetros y dimensiones: iguales a los tubos de Pitot NPL con angulo de 90º.



Rogamos no duden ponerse en contacto para aplicaciones especiales o comentarnos sus necesidades.

- Ref: GPN.U3B Tapones (para sellar agujeros en conducto) Ø 7,5 a 9,5 mm.
GPN.U5B Tapones (para sellar agujeros en conducto) Ø 9 a 11 mm.
GPN.U6B Tapones (para sellar agujeros en conducto) Ø 10 a 11,5 mm.
GPN.U8B Tapones (para sellar agujeros en conducto) Ø 11,5 a 13 mm.
GPN.U10B Tapones (para sellar agujeros en conducto) Ø 12,5 a 14,5 mm.
GPN.U12B Tapones (para sellar agujeros en conducto) Ø 14 a 16 mm.
GPN.U17B Tapones (para sellar agujeros en conducto) Ø 18,5 a 21 mm.

Graduación (mm) marca en rojo en el asta
Parao tubos de Pitot Ø 3, 6, 8, 12, 14 mm.

- Ref: TP GR 03
TP GR 06
TP GR 08
TP GR 12
TP GR 14



Tubo

- Ref: TC 5 X 8 Tubo transparente
Ø 5 X 8 mm para instalaciones fijas.
TS 4 X 7 Tubo silicona
Ø 4 X 7 mm Blanco o negro para tubos de Pitot.



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Distribuido por



QUOTE NUMBER: Q8569

Date of Issue:	14.08.13
Contact:	Ronald Luis Díaz La Torre
Company:	PONTIFICIA UNIVERSIDAD CATÓLICA DEL PERÚ
Location:	Peru
Email	PONTIFICIA UNIVERSIDAD CATÓLICA DEL PERÚ
Tel No:	diaz.ronald@pucp.edu.pe
Enquiry Reference:	+511-6262000 - 4884
Contact Reference:	Dave Wheatley, Sales Engineer




M420 Rotary Torque Transducer
Size 1A /0-10Nm

M420 ROTARY TORQUE TRANSDUCER

CONVENTIONAL ROTARY TORQUE TRANSDUCER WITH ROTARY SHAFT AND STATIC BODY

The Series M420 Rotary Torque Transducer transmits digital data providing the end user with clean and definitive data transmission. The on-shaft signal is converted digitally and amplified; this signal is taken off the shaft and processed by a variety of means including various indicators or by Software including LabView™ and Datum Electronics own TorqueLog Software (supplied with the instrument). The transducer can also interface to data loggers, and other PLC's via an analogue output if required.

PRICING OPTIONS FOR Q8569					
PRODUCT	DESCRIPTION	QTY	PRICE	TOTAL	
M420 S 1A Rotary Torque Transducer	Torque Ratings	0-10Nm	1	£1,350.00	£1,350.00
	Max Rotation Speed	0-10,000rpm			
	Data Output	Digital RS232 (Fig 2)			
	Accuracy	0.1%			
	Data Sampling Rate	100sps			
	Operating Temp	0-70°C			
	IP Rating	IP54			
	Supply Voltage	15-24VDC			
	Cable Length	4 metre to interface (Standard)			
Calibration Certificate	Supplied as standard				
TorqueLog Software	FOC				
Sample Rate Upgrade	1000sps Torque Output Upgrade – no speed output. No universal interface included	0	£100.00		
	1000sps Torque with Analogue Speed output – includes Analogue Interface	0	£550.00		
Additional Output Options  Universal interface requires 15-24volt supply	Speed output rpm 1 pulse per rev (<i>required for power display output</i>)		Included	FOC	
	USB Output Module (Fig 1)	0	£200.00		
	Analogue Outputs (0-10V/4-20mA) includes USB (Fig 1)	1	£250.00	£250.00	
	Note: USB and Analogue outputs require the interface shown left. See Fig 1 below				
Please add in any options from above					
			TOTAL SYSTEM PRICE	£1,600.00	

(All prices are Ex Works and VAT exclusive)

Datum Electronics
Needles Building, Trinity Wharf
East Cowes, Isle of Wight, PO32 6RF

We have based this quotation on the information as we understand it. If this does not exactly meet your requirements please contact us.

T: +44 (0) 1983 28 28 34

This quotation is issued subject to the Standard Terms and Conditions of Datum Electronics Limited a copy of which is available on request. The quotation is valid for 30 days and our terms of payment are strictly 30 days from date of invoice

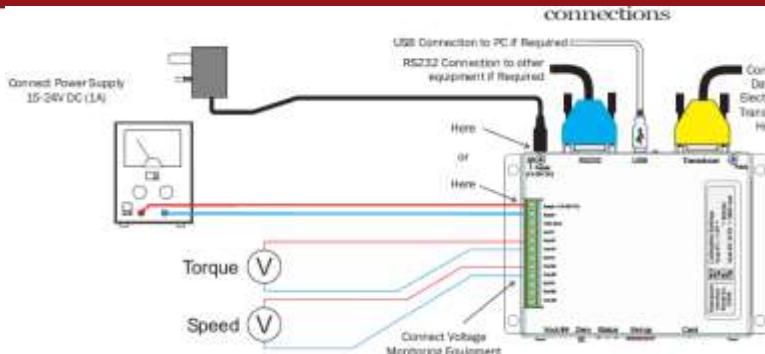


Fig 1) with interface (USB and Volts Analogue)

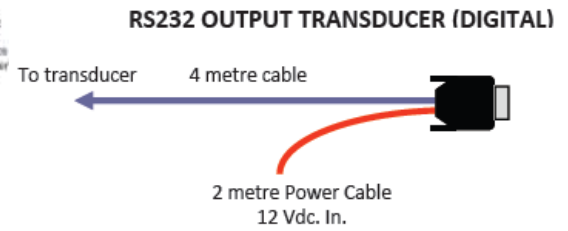
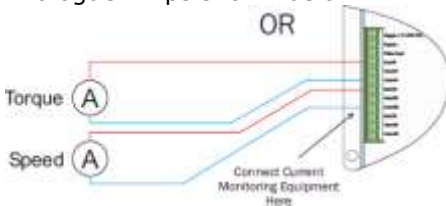


Fig 2) "Basic" Standard RS232 output (req. 12Vdc)

The Transducer interface requires 15-24Volts dc supply power. The M420 connects directly to this interface.

Analogue Amps shown below:



Transducer interface requires 15-24volt supply

Delivery Terms
Standard delivery for the above transducers is ...3-4 weeks..... from receipt of a purchase order.



Datum Electronics TorqueLog Software

Datum Electronics TorqueLog software is an easy and convenient way of collecting data. Compatible with Windows XP, Vista and Windows 7, the TorqueLog software provides a direct readout of Torque, Speed and Power on a PC with additional facilities to read peak torque and log data to other applications including Microsoft Excel. The enhanced features of this software include:

- Calibrated Display of Torque in Nm or lb/ft
- Display of Speed (rpm)
- Display of Power in kW or HP
- Peak Torque, Speed and Power Capture Facility
- Data logging of Torque (or Torque, Speed and Power)



Using a USB or Serial Port (adapter required) from either a Laptop or desktop PC connected to the Series 420 Torque Transducer, you can have the data that you require at your fingertips, allowing you to process the information which can be printed, displayed graphically or saved as a spreadsheet.

TorqueLog software is issued FOC with the M420 Torque transducer

Payment Options

Payment would be on an upfront basis – this can be done as a pro-forma invoice or through our Google checkout service if you wish to pay with credit card. Please send your purchase order/order confirmation via email or fax: Fax: +44 (0) 1983 28 28 35 Email: dave.wheatley@datum-electronics.co.uk

I trust the quotation is of interest to you and provides all information you require. If you require any further information please do not hesitate to contact me. I look forward to hearing from you in due course.

Best regards,

Dave Wheatley
 Sales
 Datum Electronics Ltd

Datum Electronics
 Needles Building, Trinity Wharf
 East Cowes, Isle of Wight, PO32 6RF

We have based this quotation on the information as we understand it. If this does not exactly meet your requirements please contact us.

TESIS PUCP

Mini Sonómetro digital SL-50 [370809]

[Medidores varios]

70.00€

IVA incluido



Este dispositivo permite que su rango de medición automática y en la elección de parámetro es el valor por defecto de forma rápida y sencilla la medición del nivel sonoro con frecuencia lineal Evaluación (dBC). Ideal para una fácil medición de ruido ambiental o de otras fuentes de ruido.

Características técnicas:

Rango de nivel de ruido: 40-130 dB.
Resolución nivel de sonido: 0,1 dB.
Precisión $\pm 3,5$ dB a 1 kilociclos.
Tiempo de respuesta: 125 Ms.
Dimensiones: (Ancho x Alto x Profundidad) 52 X 130 X 32 mm.
Respuesta de frecuencia: 30 Hz - 4 kilociclos.
Peso: 135 g.
Alimentación: 9 V.
Más datos técnicos: micrófono diámetro 1 / 2 ".
Retroiluminación del display mediante sensor.

[Manual de usuario.](#)