



Better components make better drives

扭力量測 完整解決方案

DATAFLEX®

Made for Motion



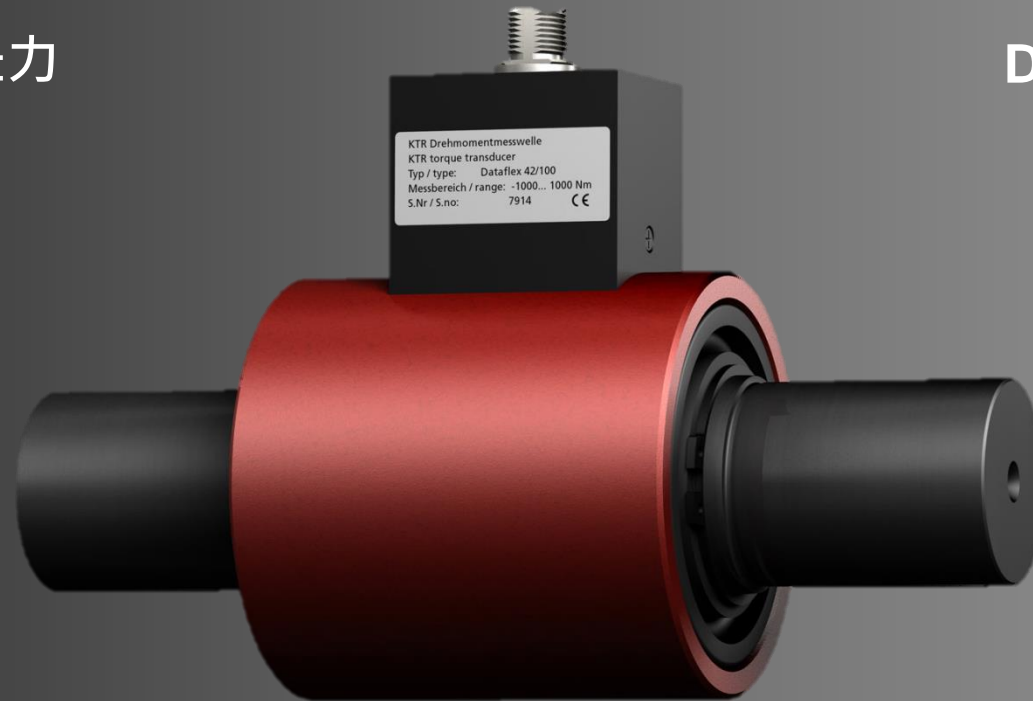
DATAFLEX – 四合一 One sensor - 4 values

Torque 扭力

Speed 速度

Angle 角度

Direction 方向



DATAFLEX – 產品列表 Product line

2 種 測量方式

6 種 型式

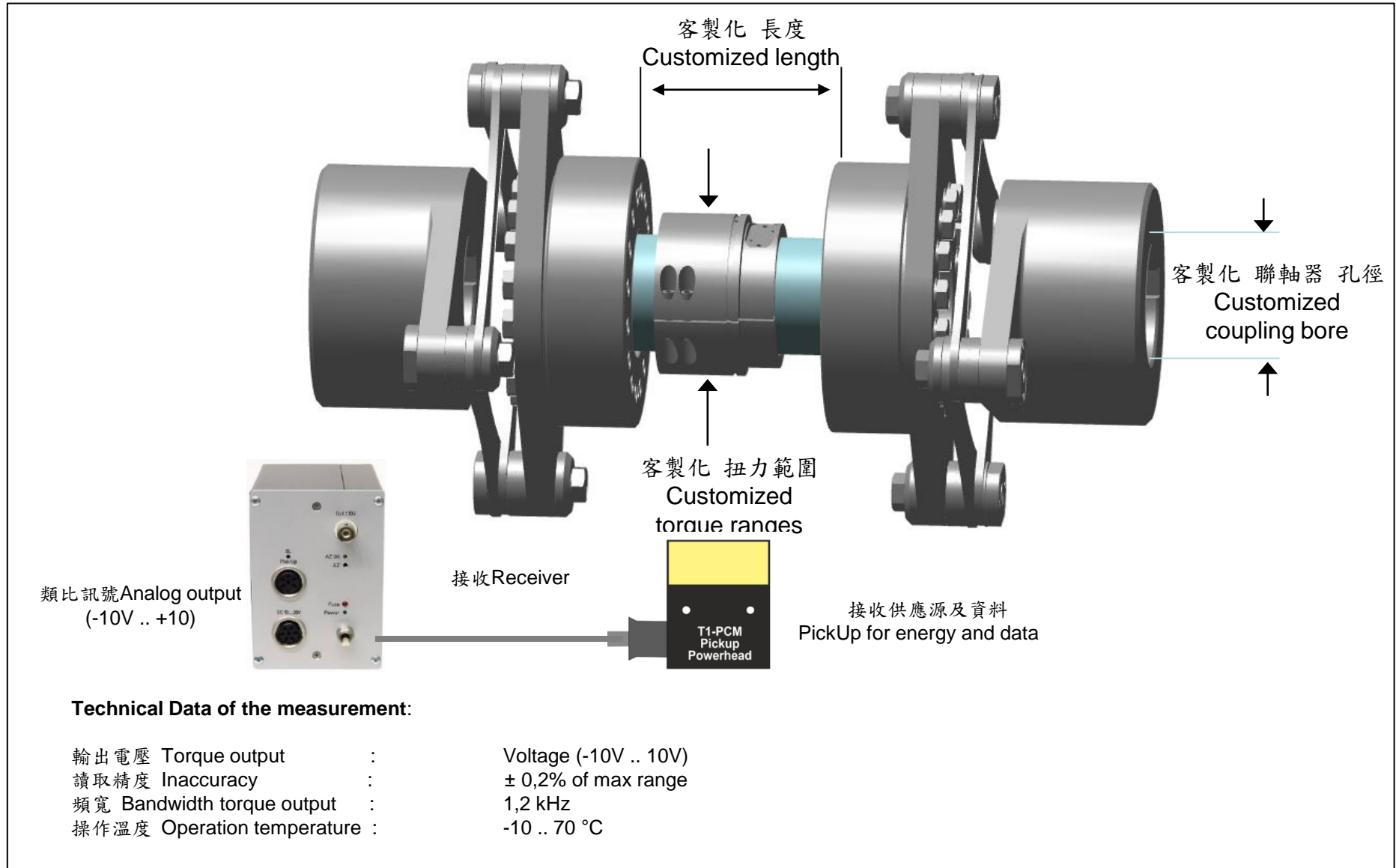
12 範圍

(10 Nm to 50,000 Nm)

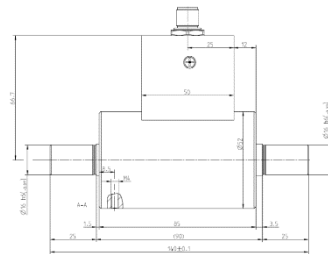


Type	Prinziple	Range (Nm)	Couplings	Inaccuracy (%)	Encoder	Connector box
DATAFLEX® 16/10	Strain gage	-10 .. 10	RADEX® NC 20	0,1 %	2 x 360 Impulses	DF02
DATAFLEX® 16/30	Strain gage	-30 .. 30	RADEX® NC 25	0,1 %	2 x 360 Impulses	DF02
DATAFLEX® 16/50	Strain gage	-50 .. 50	RADEX® NC 25	0,1 %	2 x 360 Impulses	DF02
DATAFLEX® 32/100	Strain gage	-100 .. 100	RADEX® N 42	0,1 %	2 x 720 Impulses	DF02
DATAFLEX® 32/300	Strain gage	-300 .. 300	RADEX® N 60	0,1 %	2 x 720 Impulses	DF02
DATAFLEX® 32/500	Strain gage	-500 .. 500	RADEX® N 60	0,1 %	2 x 720 Impulses	DF02
DATAFLEX® 42/1000	Strain gage	-1k .. 1k	RADEX® N 80	0,1 %	2 x 720 Impulses	DF02
DATAFLEX® 70/3000	Strain gage	-3k .. 3k	RADEX® N 90	0,1 %	2 x 450 Impulses	DF02
DATAFLEX® 70/5000	Strain gage	-5k .. 5 k	RADEX® N 105	0,1 %	2 x 450 Impulses	DF02
DATAFLEX® 110/10000	Strain gage	-10k .. 10k	Individually	0,1 %	2 x 720 Impulses	DF02
DATAFLEX® 110/20000	Strain gage	-20k .. 20k	Individually	0,1 %	2 x 720 Impulses	DF02
DATAFLEX® 140/50000	Light sensor	-50k .. 50k	Individually	0,5 %	1 x 60 Impulses	DF02

DATAFLEX – 客製化設計 customized design



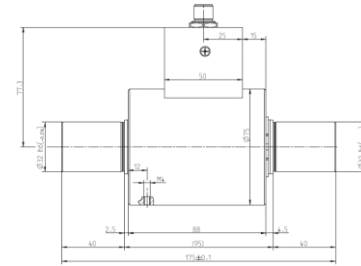
DATAFLEX 16 – Data sheet



DATAFLEX 16

Ranges	-10...10 Nm, -30...30 Nm, -50...50 Nm
Inaccuracy ¹	0,1 %
Torque output	-10 V ... 10 V
Speed impulse output	360 Impulses / revolution, 2 channels, 90 degree phase-delayed, 5 / 24 V
Speed DC output	0 ... 10 V, scalable
Direction output	5 / 24 V
Temperature range	0 ... 55 °C
Static load limit ¹	150 %
Braking load ¹	300 %
Max. speed	10000 1/min
Recommended couplings	RADEX NC20, RADEX NC25

DATAFLEX 32 - Data sheet

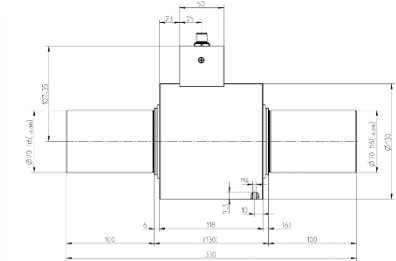
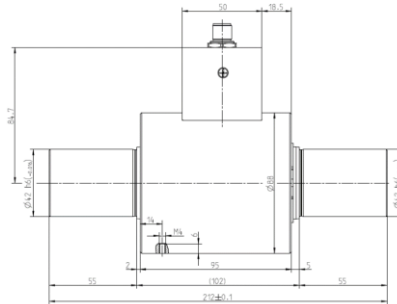


DATAFLEX 32

Ranges	-100...100 Nm, -300...300 Nm, -500...500 Nm
Inaccuracy ¹	0,1 %
Torque output	-10 V ... 10 V
Speed impulse output	720 Impulses / revolution, 2 channels, 90 degree phase-delayed, 5 / 24 V
Speed DC output	0 ... 10 V, scalable
Direction output	5 / 24 V
Temperature range	0 ... 55 °C
Static load limit ¹	150 %
Braking load ¹	300 %
Max. speed	7500 1/min
Recommended couplings	RADEX N42, RADEX N60

DATAFLEX 42 - Data sheet

DATAFLEX 70 - Data sheet



DATAFLEX 42

Ranges	-1000...1000 Nm
Inaccuracy ¹	0,1 %
Torque output	-10 V ... 10 V
Speed impulse output	720 Impulses / revolution, 2 channels, 90 degree phase-delayed, 5 / 24 V
Speed DC output	0 ... 10 V, scalable
Direction output	5 / 24 V
Temperature range	0 ... 55 °C
Static load limit ¹	150 %
Braking load ¹	300 %
Max. speed	6500 1/min
Recommended couplings	RADEX N80

¹ – related to max. range

DATAFLEX 70

Ranges	-3000...3000 Nm, -5000...5000 Nm
Inaccuracy ¹	0,1 %
Torque output	-10 V ... 10 V
Speed impulse output	450 Impulses / revolution, 2 channels, 90 degree phase-delayed, 5 / 24 V
Speed DC output	0 ... 10 V, scalable
Direction output	5 / 24 V
Temperature range	0 ... 55 °C
Static load limit ¹	150 %
Braking load ¹	300 %
Max. speed	4000 1/min
Recommended couplings	RADEX N90, RADEX N115

¹ – related to max. range

DATAFLEX 110 - Data sheet



DATAFLEX 110

Ranges	-10000...10000 Nm, -20000...20000 Nm
Inaccuracy ¹	0,1 %
Torque output	-10 V...10 V
Speed impulse output	720 Impulse / revolution, 2 channels, 90 degree phase-delayed, 5 / 24 V
Speed DC output	0 ... 10 V, scalable
Direction output	5 / 24 V
Temperature range	0 ... 55 °C
Static load limit ¹	150 %
Braking load ¹	300 %
Max. speed	3000 1/min
Recommended couplings	Individually selectable

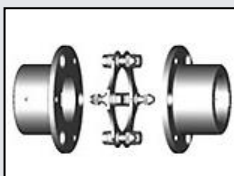
¹ – related to max. range

DATAFLEX 標準配備

扭力計



聯軸器



Standard combinations 標準組合



Bus / RX-TX電纜



類比轉接盒

Size	Coupling	Connector cable	Connector box
DATAFLEX® 16/10, 16/30,16/50	RADEX® NC 20 RADEX® NC 25	- Suitable for all types -Length: 2m and 5m -適用於各種接頭 2~5m	Suitable for all types 類比轉接盒
DATAFLEX® 32/100, 32/300,32/500	RADEX® NC 42 RADEX® NC 60		
DATAFLEX® 42/1000	RADEX® N 80		
DATAFLEX® 70/3000	RADEX® N 90		
DATAFLEX® 70/5000	RADEX® N 105		
DATAFLEX® 110/10000, 110/20000	individually		
DATAFLEX® 140/50000	individually		

DATAFLEX – 訊號盒 connector box

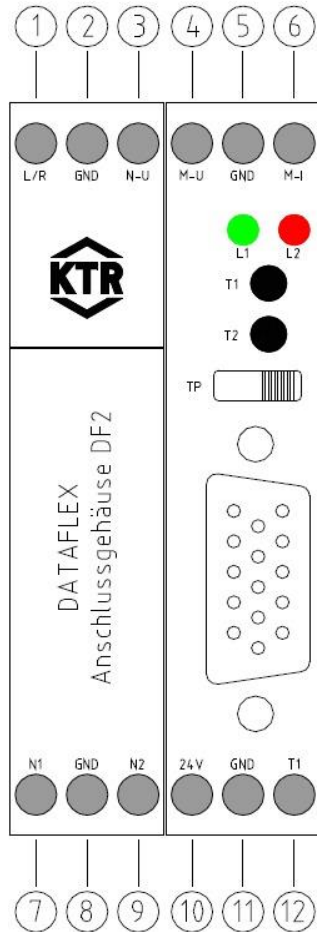
Connector box DF02

The connector box DF 02 provides all inputs and outputs of the torque sensor and features a scalable frequency/voltage converter. The speed information is given out as an impulse signal as well as a DC voltage.

Name	Function	DATAFLEX 22, 42, 85, 140 (old)	DATAFLEX 16, 32 42, 70, 110
Input supply			
24V	Supply voltage +	24 V DC \pm 4V / 100mA max.	24 V DC \pm 4V / 100mA max.
GND	Supply voltage -		
Output torque			
M-U	Voltage output +	0V ... 10V ($R_A=1k\Omega$)	-10V ... 10V ($R_A=1k\Omega$)
GND	Ground voltage output		
M-I	Current output	4mA ... 20mA	-
Impulse outputs speed			
N1	Impulse output channel 1	HTL, TTL (24V, 5V, 1 x 60 Imp./U.)	HTL, TTL (24V, 5V, 2x 360 (720) Imp./U.)
GND	Ground impulse outputs		
N2	Impulse output channel 2	HTL, TTL (24V, 5V, 1 x 60 Imp./U.)	HTL, TTL (24V, 5V, 2x 360 (720) Imp./U.)
DC outputs speed			
R/L	Direction signal speed	-	HTL, TTL (24V, 5V, CW = 1)
GND	Ground speed outputs		
N-U	DC Voltage output speed	0V ... 10V (scalable)	0V ... 10V (scalable)
Other connections			
T1	switch T1	external switch connection T1	external switch connection T1
L1, L2	signal LEDs		
T1, T2	switch T1, T2	switch for programming	switch for programming
TP	low pass switch	filter for torque signal (scalable)	filter for torque signal (scalable)
-	connector torque sensor		



Electrical in- and outputs



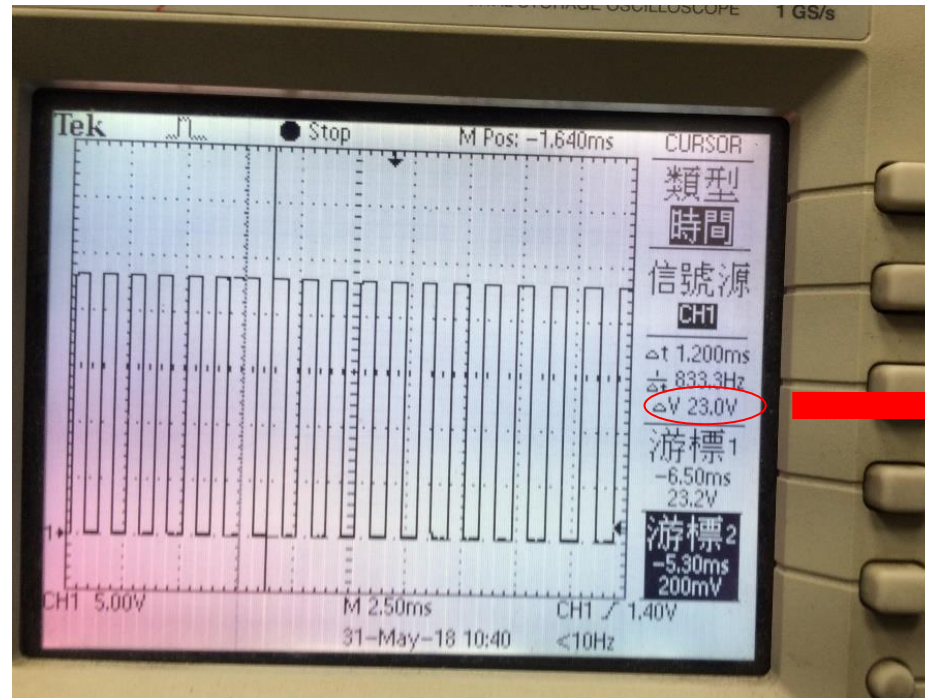
No.	Description	Function	Features
Input operating voltage			
10	24V	Supply voltage +	24 V DC \pm 4 V / 100 mA
11	GND	Supply voltage -	
Torque output			
4	M-U	Output voltage +	-10 V ... 10 V ($R_A = 1 \text{ k}\Omega$)
5	GND	Ground torque output	
6	M-I	Without function	
Speed output pulse signal			
7	N1	Speed output channel 1	HTL (24V, 360 pulses/rev.) TTL (5V, 360 pulses/rev.)
8	GND	Ground for pulse speed output	
9	N2	Speed output channel 2	HTL (24V, 360 pulses/rev.) TTL (5V, 360 pulses/rev.)
Speed output DC-voltage			
1	R/L	Direction signal speed	HTL (24V, clockwise = 0) TTL (5V, clockwise = 0)
2	GND	Ground for DC speed output	
3	N-U	Speed of DC voltage output	0 V ... 10 V (scalable)
Other connections / operating devices			
12	T1	Push button T1	External push button connection T1
13	L1, L2	Signal LEDs	
14	T1, T2	Push button T1, T2	Push button for programming
15	TP	Switch low pass filter	On/off switch low-pass
16	-	Connection of measuring shaft	1:1 Connection cable
17	-	Switch for speed scaling	see table 11

→ 註解一

→ 註解二

註解一

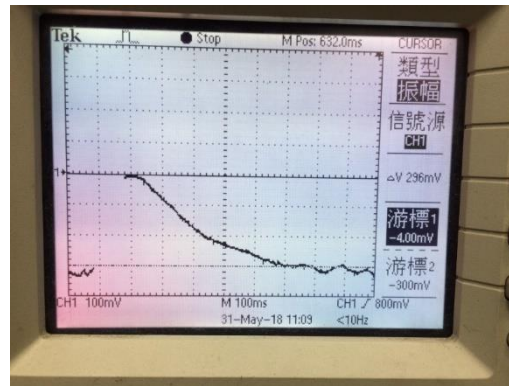
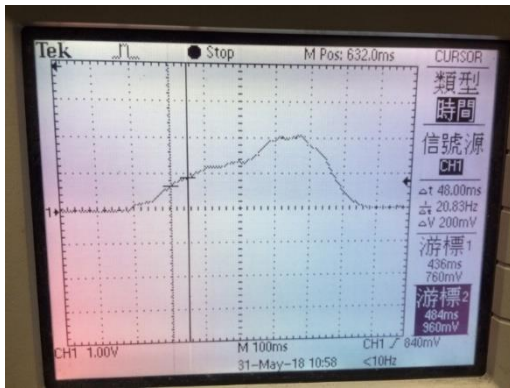
Speed output pulse signal			
7	N1	Speed output channel 1	HTL (24V, 360 pulses/rev.) TTL (5V, 360 pulses/rev.)
8	GND	Ground for pulse speed output	
9	N2	Speed output channel 2	HTL (24V, 360 pulses/rev.) TTL (5V, 360 pulses/rev.)



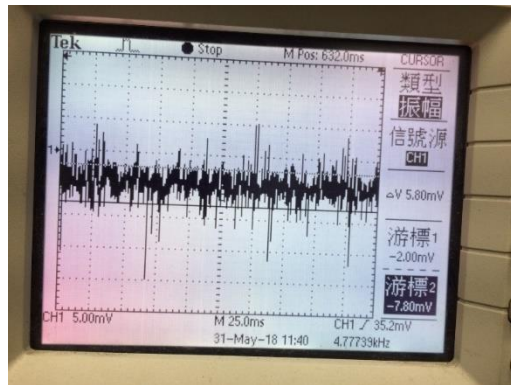
→ (範例使用24V)

註解二

Speed output DC-voltage			
1	R/L	Direction signal speed	HTL (24V, clockwise = 0) TTL (5V, clockwise = 0)
2	GND	Ground for DC speed output	
3	N-U	Speed of DC voltage output	0 V ... 10 V (scalable)



正反轉



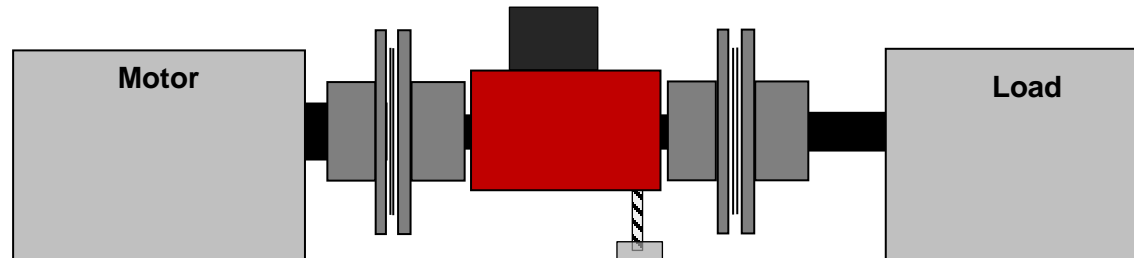
測試扭力計沒有加負載情況下，
所取波形，可證明精度<0.1%

(計算式 $10V=10,000mV \cdot 5.8/10000=0.058\%$)

a) Direct assembly

The shaft will be mounted directly between motor and load

- + cost efficient solution
- Centering necessary after changing one component

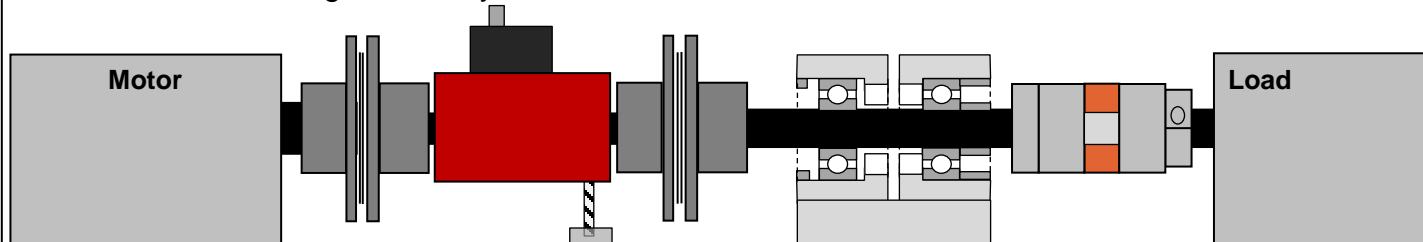
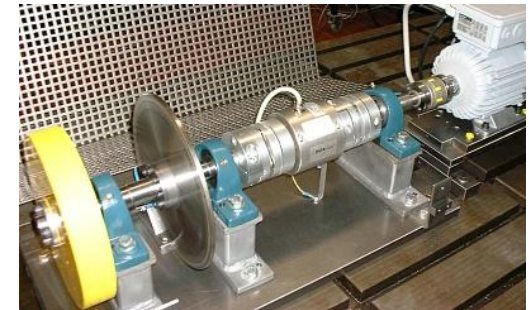


		1,2,3	4	5		
No.	amount	Type			comment	
1	1x	RADEX N60 Ø55 Flange			Motor shaft	
2	1x	RADEX N60 steel laminar				
3	1x	RADEX N60 clamping hub 32mm			Ø32	
4	1x	DATAFLEX 32/300 torque transducer			300 Nm, 0.3 Nm inaccuracy	
5	1x	RADEX N60 complete (2 x clamping hubs, 32mm, steel laminar)				

b) Additional bearing

The torque transducer is mounted between motor and an additional bearing. The specimen is coupled for example via a pluggable ROTEX-GS

- + centering only one time necessary
- + components can be exchanged quickly
- additional bearing necessary



		1,2,3	4	5	6	7	8	9		
Nr.	Menge	Typ							Kommentar	
1	1x	RADEX N60 Ø55 flange hub							Motor shaft	
2	1x	RADEX N60 steel laminar								
3	1x	RADEX N60 clamping hub 32mm							Ø32	
4	1x	DATAFLEX 32/300 torque sensor							300 Nm, 0.3 Nm inaccuracy	
5	1x	RADEX N60 complete (2 x clamping hubs 32mm, steel laminars)								
6	1x	Losse-fixed-bearing + shaft Ø32							Not delivered by KTR	
7-9	1x	ROTEX GS 28							$M_{Max} = 150Nm$	

16-32 系列測台配置例

Vorschlag Firma AMServ, Motorprüfstand 3-90KW



Nr.	Anzahl	Typ	Kommentar
1	1x	RADEX NC25 EK Ø16/Ø16	Ø Motorwelle, Passfeder?
2	1x	DATAFLEX 16/30	
3	1x	RADEX NC25 EK Ø16/Ø7	Ø Welle?
4	1x	Los-Festlagerung (z.B. SKF SNL) + Welle	(nicht im Lieferumfang)
5	1x	ROTEX GS 24 Klemmbrabe Typ 2.5 od. 2.6	Ø Welle?
6	1x	ROTEX GS 19 Zahnkranz 98SHA	
7	1x	ROTEX GS 24 Klemmbrabe Typ 2.5 od. 2.6	Ø Motorwelle, Passfeder?

Vorschlag Auslegung Flux Pumpen 10.01.13



Nr.	Anzahl	Typ	Kommentar
1	1x	RADEX NC25 EK Ø16/Ø16	Ø Motorwelle, Passfeder?
2	1x	DATAFLEX 16/30	
3	1x	RADEX NC25 EK Ø16/Ø7	Ø Welle?
4	1x	Los-Festlagerung (z.B. SKF SNL) + Welle	(nicht im Lieferumfang)
5	1x	ROTEX GS 24 Klemmbrabe Typ 2.5 od. 2.6	Ø Welle?
6	1x	ROTEX GS 24 Zahnkranz 98SHA	
7	1x	ROTEX GS 24 Klemmbrabe Typ 2.5 od. 2.6	Ø Motorwelle, Passfeder?

Vorschlag Firma Mercs, M200L



Nr.	Menge	Typ	Kommentar
1	1x	RADEX N60 Ø55 Flanschnabe mit Passfedernut	Motorwelle
2	1x	RADEX N60 Lamellenpaket	
3	1x	RADEX N60 Spannringbe 32mm	Messwellenselle Ø32
4	1x	DATAFLEX 32/300	300 Nm, 0.3 Nm Ungenauigkeit
5	1x	RADEX N60 komplett (2 x Spannringbein Ø32, Lamellenpaket)	
6	1x	Los-Festlagerung (z.B. SKF SNL) + Welle Ø32	Nicht im Lieferumfang
7	1x	ROTEX GS 28 Spannringbe Aufd. 6.0 Stahl Ø32	M _{zul} = 1500Nm
8	1x	ROTEX GS 28 Zahnkranz 98SHA	
9	1x	ROTEX GS 28 Klemmbr. 2flach gesicht. mit Nut Aufd. 2.6 Ø16, Ø20, Ø28	für unterschiedliche Pumpen

Vorschlag Siemens Chemnitz 06.03.13



Nr.	Anzahl	Typ	Kommentar
1	1x	RADEX NC20 EK Ø7/Ø16	Ø Motorwelle, Passfeder?
2	1x	DATAFLEX 16/10	
3	1x	RADEX NC20 EK Ø16/Ø7	Ø Welle? (z.B. 15)
4	1x	Los-Festlagerung + Welle	(nicht im Lieferumfang)
5	1x	ROTEX GS 19 Klemmbrabe Typ 2.5 od. 2.6	
6	1x	ROTEX GS 19 Zahnkranz 98SHA	
7	1x	ROTEX GS 19 Klemmbrabe Typ 2.5 od. 2.6	Ø Motorwelle, Passfeder?

Vorschlag Auslegung Hochschule Beuth 10.12.2012



Nr.	Anzahl	Typ	Kommentar
1	1x	Radex NC20 EK Ø7/Ø16	Ø Motorwelle, Passfeder?
2	1x	DATAFLEX 16/10	
3	1x	Radex NC20 EK Ø16/Ø7	Ø Welle?
4	1x	Los-Festlagerung (z.B. SKF SNL) + Welle	(nicht im Lieferumfang)
5	1x	ROTEX GS 19 Klemmbrabe Typ 2.5 od. 2.6	Ø Welle?
6	1x	ROTEX GS 19 Zahnkranz 98SHA	
7	1x	ROTEX GS 19 Klemmbrabe Typ 2.5 od. 2.6	Ø Motorwelle, Passfeder?

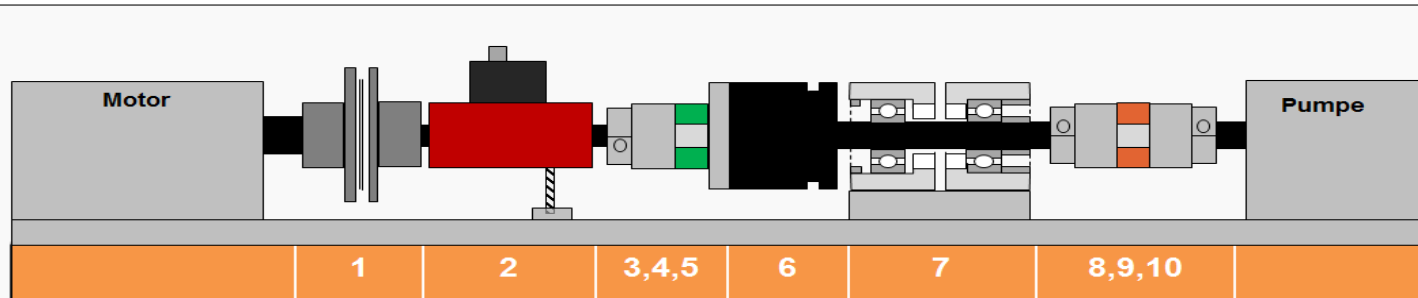
Vorschlag Auslegung IAV



Nr.	Anzahl	Typ	Kommentar
1	1x	RADEX NC20 EK Ø7/Ø16	Ø Motorwelle, Passfeder?
2	1x	DATAFLEX 16/10	
3	1x	RADEX NC20 EK Ø16/Ø7	Ø Welle?
4	1x	Los-Festlagerung + Welle	(nicht im Lieferumfang)
5	1x	ROTEX GS 24 Klemmbrabe Typ 2.5 od. 2.6	Ø Welle?
6	1x	ROTEX GS 24 Zahnkranz 98SHA	
7	1x	ROTEX GS 24 Klemmbrabe Typ 2.5 od. 2.6	Ø Motorwelle, Passfeder?

16-32 系列 加扭力限制 保護 測台配置例

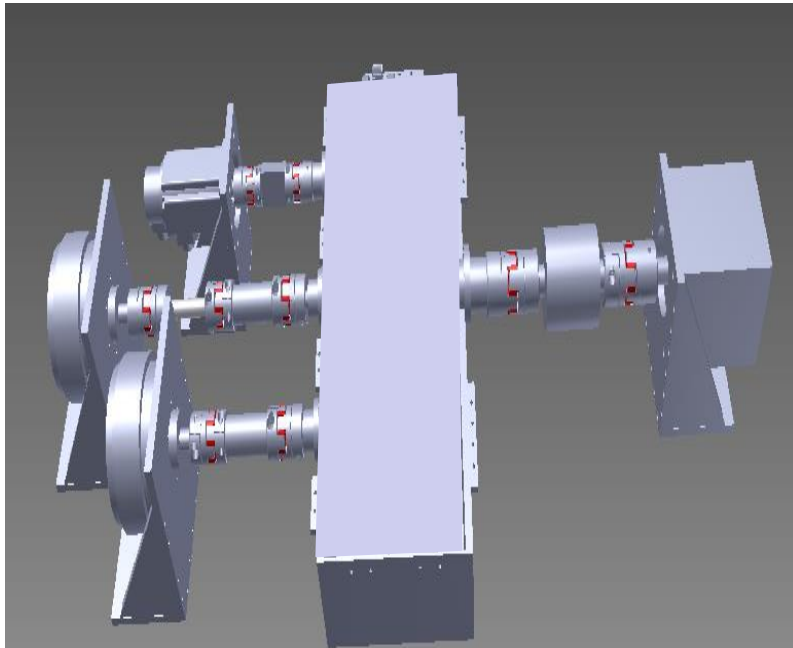
Vorschlag 160 kW



Nr.	Menge	Typ	Kommentar
1	1x	RADEX N60 (1x Flanschnabe Ø65, 1x Lamellenpaket, 1x Spannringnabe Ø32)	
2	1x	DATAFLEX 32/300 (+-500Nm, 0,1% Genauigkeit, Drehzahl 720 i/U)	
3	1x	ROTEX GS48 Spannringnabe Ver. 6.0 Ø32	
4	1x	ROTEX GS48 Zahnkranz 64ShD	
5	1x	ROTEX 48 Mitnehmerflansch für SI4	
6	1x	KTR SI 4 T3 FR FT in Freilaufausführung M=500Nm Ø40	
7	1x	Los-Festlagerung mit Welle Ø40 glatt	Kein KTR Produkt
8	1x	ROTEX GS48 Spannringnabe Ver. 6.0 Ø40	
9	1x	ROTEX GS48 Zahnkranz 98ShA	
10	1x	ROTEX GS48 GS Naben <u>Ausf. 1.0</u> Ø48, Ø32, Ø28	Untersch. Ø f. Pumpen

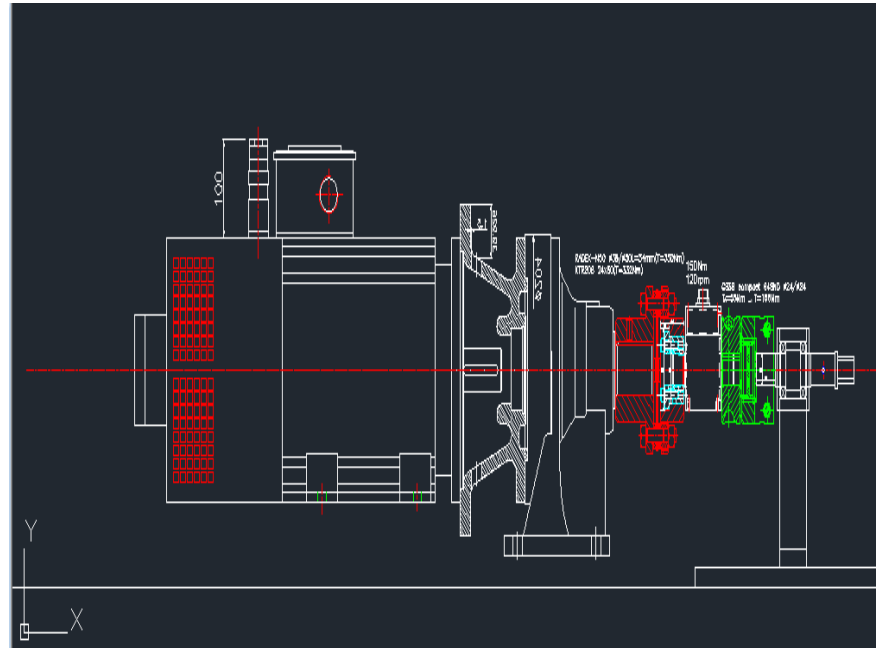
齒輪箱 速比 動力 計測台機械 設計 案例 3 D

Gearbox , Ratio , output Testing
Bench

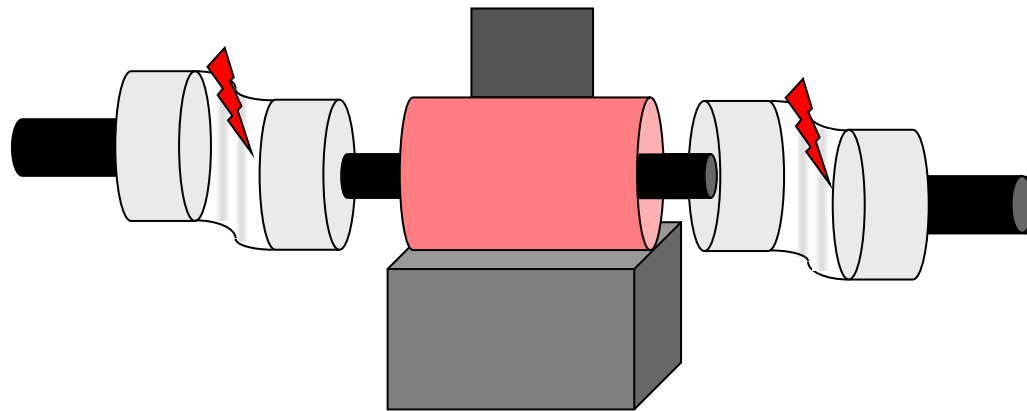
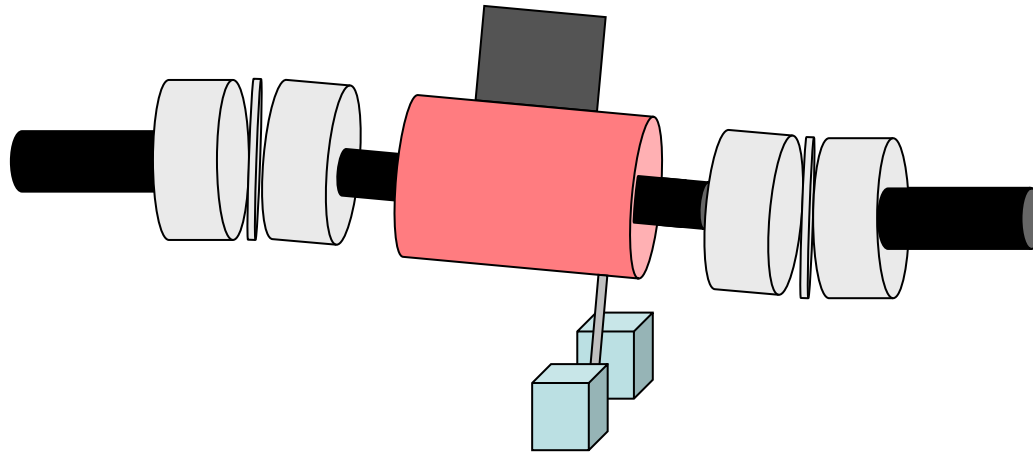


動力 計測台機械 設計 案例 2 D

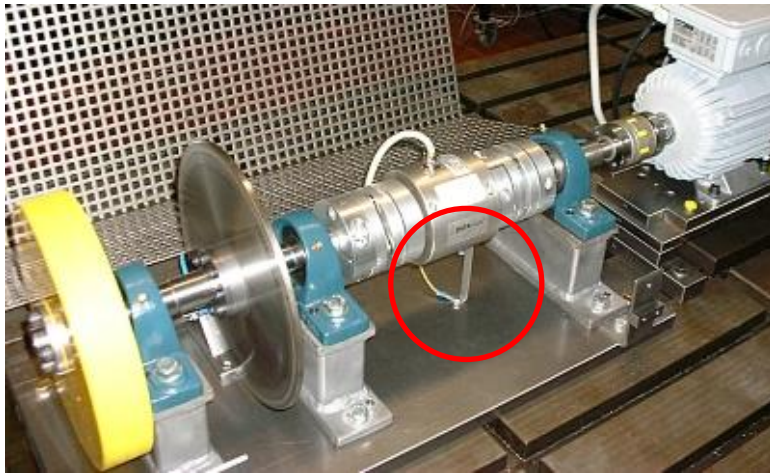
AC, DC Servo Motor



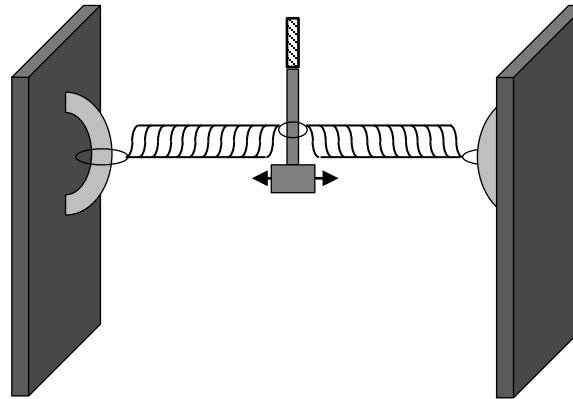
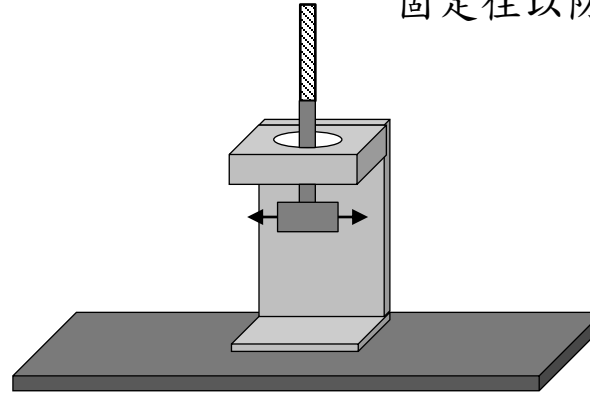
DATAFLEX – 組裝 assembly



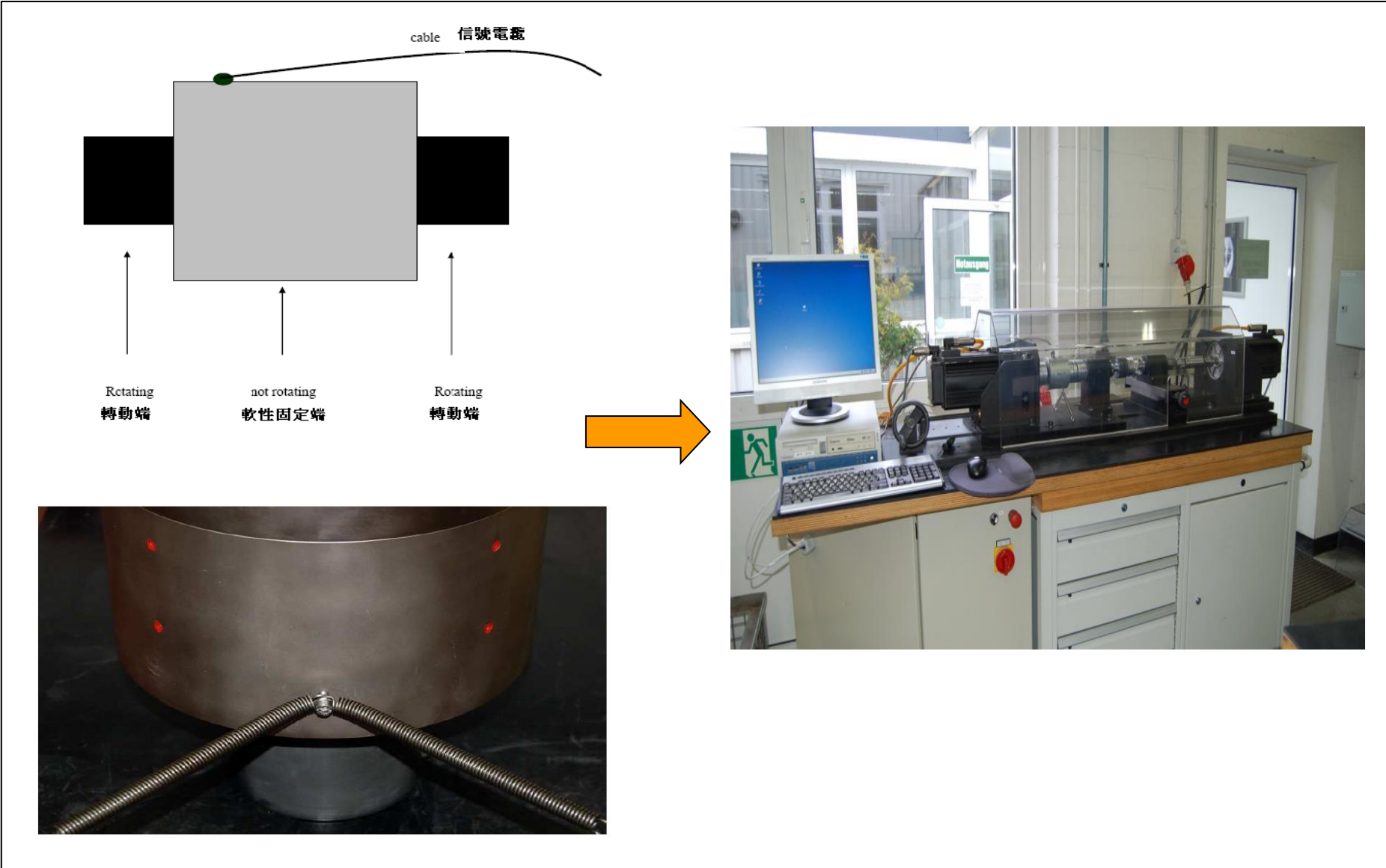
DATAFLEX – 固定方式 lock against rotation



Torque sensor 的外殼必須被
固定住以防止旋轉。

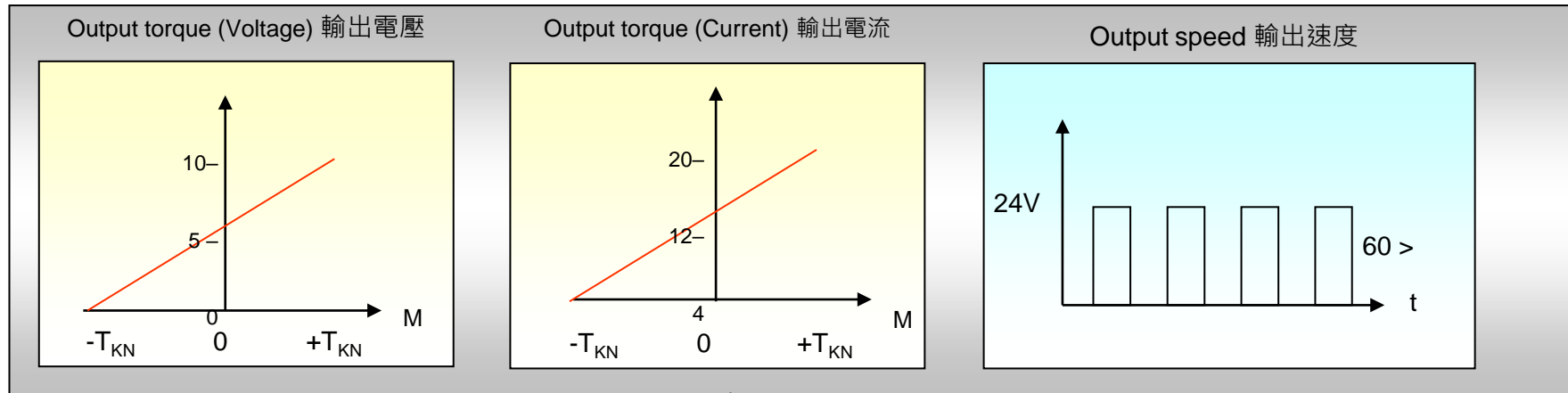
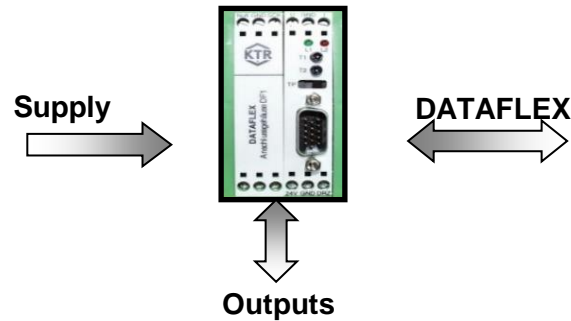


DATAFLEX – 固定方式 lock against rotation



The diagram illustrates the DATAFLEX cable system for a rotating machine. It shows a central grey square representing the machine's body, which is labeled "not rotating 軟性固定端" (non-rotating flexible fixed end). Two black rectangles on either side represent the "Rotating 轉動端" (rotating end). A cable, labeled "cable 信號電纜" (signal cable), is shown connecting the top of the machine to the rotating ends. An orange arrow points from the diagram to a photograph of the actual machine in a laboratory setting. The photograph shows a large metal cylindrical machine with a DATAFLEX cable system installed. The machine is mounted on a wooden cabinet with a computer monitor, keyboard, and mouse on top. The machine has four red laser dots on its side, and the DATAFLEX cable is connected to the bottom of the machine.

DATAFLEX – 數據採集 data acquisition



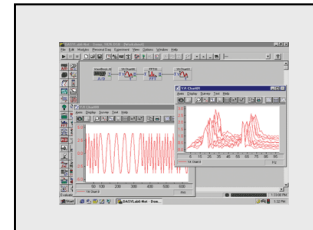
Voltmeter
電壓表



Scope
示波器



Datalogger
數位儲存計



Hardware, Software
外接硬體軟體



Machine
機台之輸入信號 Koe 2017

DATAFLEX – 數據採集 data acquisition

<i>Overview</i>	Scaling	Frequency	Storing	Analysis
Multimeter (1)	No	Low	No	No
Process displays (2)	Yes	Low	No	No
Data logger (1)	Yes	Medium	Yes	No
Oszilloscope (1)	No	High	No	No
PC data acquisition (3) (4)	Yes	High	Yes	Yes



Data Translation USA

Taiwan agent :

佳位科技

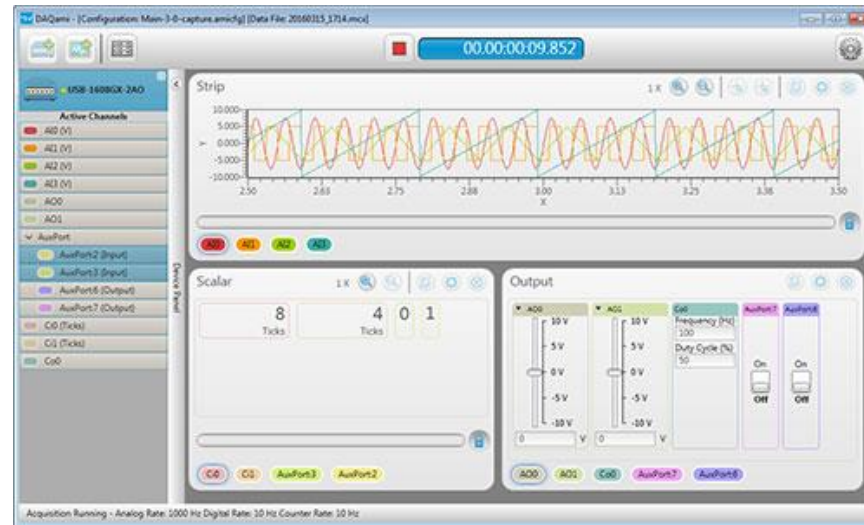


Recommendation: Fast data acquisition at affordable prices

KTR recommends the low priced measuring data acquisition from Data Translation The established hardware USB 231 contains 4 analog inputs which are digitalized with an accuracy of 16 Bit. Further hardware modules contain a wide selection of analog and digital in- and outputs. By use of the low priced software DAQami the data are displayed on your computer screen and can be saved and analyzed.



+



Verbrennungsmotor



Combustion engine

Schraubenkompressor



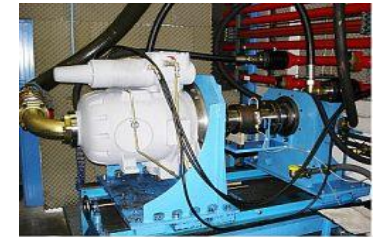
Screw compressor

Kolbenkompressor



Piston compressor

Axialkolbenpumpe



Axial piston pump

Futtermischer



Forage Mixer

Düngestreuer



Spreader

Einstellprüfstand



Adjustment test stand

Containerkran



Container crane

Montageplatz



Assembly Area

Getriebeprüfstand



Gearbox test stand

Minilader



Excavator

Eismaschine



Ice machine

Mähdrescher



Harvester

Montage Stoßdämpfer



Car damper

Elektromotoren



Electric motors

Pumpenprüfung



Pump tests



Wenn Sie viel bewegen wollen ...

Made for Motion 