

數字扭力測試儀

DIGITAL TORQUE METER

Motive

■ B30 ■ B400 ■ B3000

用戶手冊
OWNER'S MANUAL

螺絲緊固工具廣泛應用在工業生產的各個領域。B型數字扭力測試儀是專為各種類型的手動、電動、氣動螺絲緊固工具測定扭力大小的儀器。三路測量傳感器與顯示儀表分體構造，擴展了測量範圍。硬件通用，針對不同特殊工具，採用裝載不同測試軟件和傳感器來保證提供強大功能。儀器可與電腦聯機進行數據通信，測試數據也可以打印記錄。是一種易操作，測量精確，通用性很强的扭力測量儀器。

B系列扭力測試儀被廣泛應用於諸多領域。如：電氣設備、家用電器、汽車、摩托車、甚至航空航天、軍工產品等行業。

■ 應用：

- 1、檢測自動停止式電動、氣動螺絲刀的輸出扭力；
- 2、檢測半自動或離合式電動、氣動螺絲刀輸出扭力；
- 3、各種扭力螺絲刀及扭力扳手的扭力設定及測量；
- 4、衝擊式電動、氣動工具；（配特制傳感器和軟件）
- 5、其它用途，諸如：用於各種卡具、夾具等。

■ 特長：

- 因扭力大小為很清晰的數字顯示，故閱讀簡單，精確。

The screw tightening tools are widely used for products in many industries range .B-X 's digital torque meter for setting the torque of serials pneumatic and electric screwdrivers. Three load sensors and one meter extend the measuring range. Hard in usually, different soft and sensors to give great function, and also for systematizing extensive production control processes with computers.

The B-X are widely used for products in many industries range.(example): electronic equipments, home equipments, automobiles, motors, aircraft, and army 's equipments.

■ USER

1. For measuring the torque setting of Automatically stopped pneumatic and electric screwdrivers;
2. For measure the torque setting of Half-Automatically stopped pneumatic and electric screwdrivers;
3. For inspecting the torque of torque drives, and wrenches;
4. For inspecting the torque of impact pneumatic and electric screwdrivers;(with special soft and sensor)
5. For many other application of which jig tools are devised.

■ FEATURES

- Torque reading is simple and accurate because torque is displayed on a clear digital display.

- 由于能保持和顯示最大扭力值，故可以為工具設定精確的扭力。
- 測量儀可以順時針，逆時針工作，因此可測量緊件和松件的扭力。
- 一臺顯示儀表可選配三個傳感器，擴展了測量範圍。
- 儀器符合統計程序控制系統。
- 模擬輸出有多種應用：波形觀測；測量數據的打印記錄。

- By holding and displaying the peak torque value, you can set torque for tools precisely.
- Meters work both clockwise and counter clockwise, so you can easily measure torque while tightening and loosening pieces.
- A meter can select three sensors so extend the measure range.
- Meters conform whit the SPC (Statistical process Control) system.
- The analog output can be used for many applications, including wave form observation, and recording and judgment of measured date.

■ 控制開關功能

■ CONTROL SWITCH FUNCTIONS

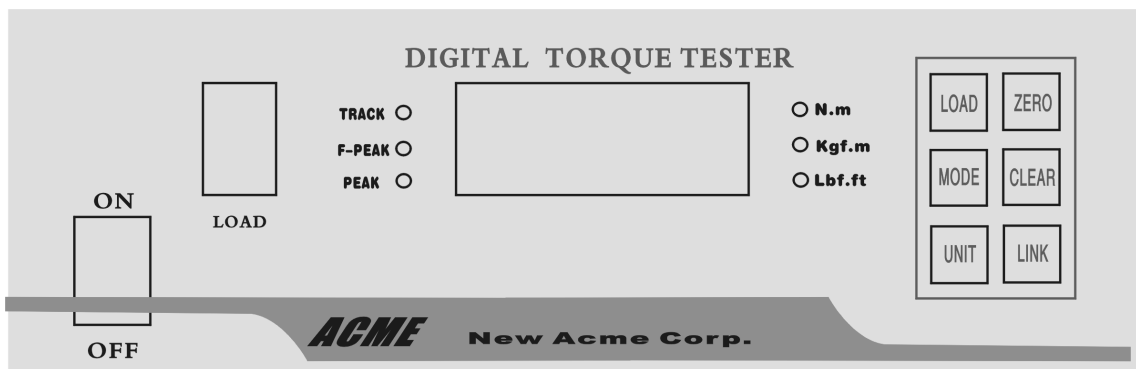


圖 1

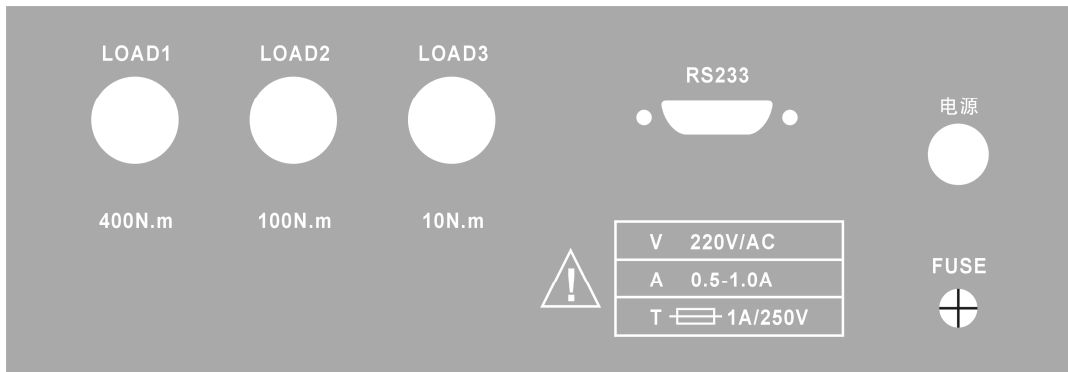


圖 2

ON/OFF 儀器電源開關

使用該儀器時，打開開關，電源指示燈亮；工作結束後關上開關，電源指示燈滅。

ON/OFF Meter power switch

Press power switch to the “on” and the meter begin turn on, the lamps is light. To the “off” the meter turn off ,the lamps is off.

LOAD 通道選擇

此儀器有三個通道對應三只不同量程的傳感器數碼管“1”“2”“3”循環選擇。例如B30儀器的“1”通道對應量程是 30-3Nm，“2”通道對應量程是 5- 0.5Nm，“3”通道對應量程是 1- 0.1Nm。

LOAD To select the desire load of measurement

This meter have three different range load of measure “1” “2” “3” . Example B30 “1” refer to 30-3N.m. “2” refer to 5-0.5N.m. and “3” refer to 1-0.1N.m.

MODE 工作方式選擇

“PEAK”方式是用來得到和顯示最大扭力讀數。

“TRACK”方式是用來：1、設置測量零點；2、跟踪動態扭力讀數。

“IMPACT”方式專門用于衝擊式電動，氣動工具測試。（配特制傳感器和專用軟件）

MODE Work mode select

“PEAK” is used to take and display maximum torque readings.

“TRACK” is used to: 1.set up zero position; 2.follow the applied torque reading and display it.

“IMPACT” is used to measure impact pneumatic and electric screw driver's torque. (use special sensor and soft)

UNIT 單位選擇

該鍵可循環選擇國際標準單位(N.m)，英制單位(Lbf.in或Lbf.ft)和慣用單位(Kgf.cm或Kgf.m)。

UNIT Select measure units

Press the “unit” to select measure units of N.m. Lbf.in(Lbf.ft) or Kgf.cm (Kgf.m).

ZERO 零點調整

該儀器在測量前，必需先在“TRACK”狀態下按一下該鍵，軟件自動調零。再選擇合適的工作方式測量。

CLEAR 清除鍵

用于清除“PEAK”或“IMPACT”工作方式得到的峰值。為下一次測量準備。

PRINT 打印鍵

連接好打印機，按一下該鍵，打印測試結果。

■ 操作規程

在開始測量之前，確定測量範圍，連接上對應量程的傳感器。固定好位置，再開機。(若無法確定所測工具量程範圍可先用大量程初測，再根據測試結果選擇合適的量程)。

1. 用 [LOAD] 鍵選擇要使用的通道和傳感器；數碼管對應“1”、“2”或“3”。
2. 用 [UNIT] 鍵選擇合適的測量單位；發光管對應：N.m, Kgf.cm 或 Kgf.m, Lbf.in 或 Lbf.ft。
3. 在“TRACK”狀態下，按 [ZERO] 鍵設定零點。
4. 用 [MODE] 鍵選擇合適的工作方式：“TRACK”、“PEAK”或“IMPACT”。
5. [CLEAR] 鍵用于清除“PEAK”或“IMPACT”工作方式得到的峰值。
6. 當用該儀器測量手動工具時：如扭力扳手，可直接在傳感器上測試。(可通過不同的互換接頭匹配)。
7. 當用該儀器測量全自動或半自動離合式電動或氣動螺絲刀時，使用合適的

ZERO Set up the zero before measure starting

Before measuring, press the [ZERO] in the “TRACK” mode, the unit auto to zero, and then select the working mode.

CLEAR Return the reading to zero

[CLEAR] is used to clear the peak that has been give of peak or impact, and prepare for next measure.

PRINT Print the recording

Connect the print, press to print the reading.

■ OPERATION

Before starting measurement, make sure the range; connecting the sensors, fix it and then turn on (If cannot make sure the range, please select big sensor).

1. [LOAD] is used to select the load and sensor the LED refer to: “1”、“2” or “3”.
2. [UNIT] is used to select measurement unit the led refer to: N.m Kgf.cm or Kgf.m Lbf.in or Lbf.ft .
3. Press the [ZERO] to set up zero in “TRACK” mode.
4. [MODE] is used to select work mode: TRACK”、“PEAK” or “IMPACT”.
5. [CLEAR] is used to clear peak that has been give of “PEAK” or “IMPACT”.
6. When used this meter to measure the handly tools; such as torque equipment, use the sensor indirectly. (used different square drive).
7. When measuring the toque of electric sc-rewdriver or pneumatic driver with torque control equipment, use the dedicated Fid-

精度調節器安置在測力傳感器頭裏（參考“使用精度調節器時扭力測量程序”）。

8. 當用該儀器測量衝擊式電動或氣動螺絲刀時，一定要選擇特制的衝擊式傳感器，工作在“IMPACT”方式。
9. 在測量其它各種旋轉工具或以上未提及的其它種類螺絲刀的扭力時，需使用適合于測力傳感器頭的附加物（參考“測力傳感器使用”）。
10. 測量操作完成后，關掉電源，從傳感器頭裏取下附加物或待測物。

aptor fixing it in the socket(Refer to Torque Measuring Procedures with the Fidaptor).

8. When use the meter to measure impact pneumatic and electric screwdrivers must select impact sensor in “IMPACT” mode.
9. When measuring the torque of various rotating tools or articles other than the above-mentioned drivers, use an attachment adequately devised to fit the Socket. (Refer to “Using the Socket”).
10. After completion of measuring operation turn the Power Switch off without fail and remove everything from the Socket.

■ 精度調節器(部件)

■ FIDAPTOR (accessory)

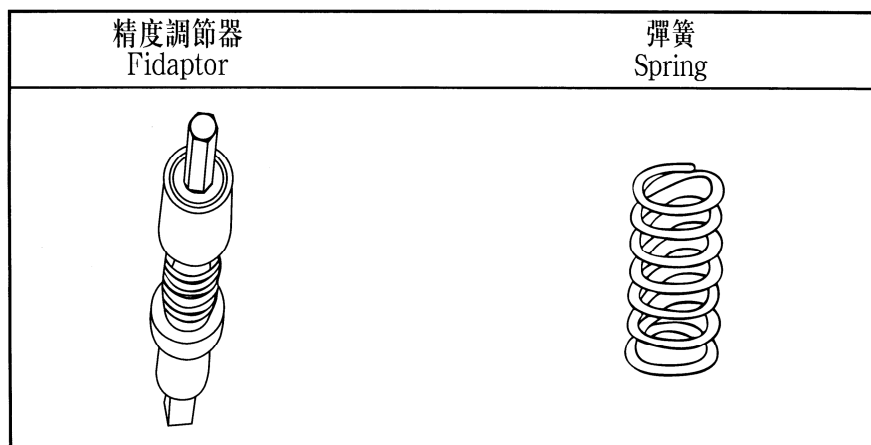


圖 3

精度調節器是一種在高速旋轉情況下緩衝和吸收慣性的調節器，它能產生和穿孔螺絲上緊時幾乎同樣的效果；要控制電動、氣動螺絲刀，把該調節器放進測力傳感器裏，接着啓動電動或氣動螺絲刀；當停止時，扭力即測出。

The Fidaptor is an adaptor that buffers and absorbs the inertia occurring during high-speed rotation. It reproduces almost the same effect as that in actual tapping screw fastening work. To control a clutch type torque-controlled screw-drive, put this adaptor in the balancing socket, then rotate the screwdriver, Torque is detected when the clutch is disengaged (rotate stopped).

■ 使用精度調節器時扭力測量程序

1. 安裝精度調節器于測力傳感器裏，且把待測螺絲刀的抓口套在精度調節器的軸耳上，若起子抓口與軸耳不匹配時，在其間使用互換軸耳連接。
2. 設定電動或氣動螺絲刀開關在反向位置，(可用手) 反轉起子，使精度調節器中的彈簧松弛；
3. 調節儀器按 **[CLEAR]** 鍵，使顯示值為零；(儀器必須先在"TRACK" 狀態下設定零點)。
4. 設定電動螺絲刀開關在正向位置，并啓動使之旋轉直至停止，(彈簧已壓縮綑緊)；
5. 當螺絲刀停止時，顯示窗口的測量數據為螺絲刀的輸出扭力；
6. 再次反轉螺絲刀，使精度調節器回到原來高度，按 **[CLEAR]** 鍵，消除數據復零。輸出扭力，可以通過重述上述2-6以區別；要設定扭力，放松或上緊電動或氣動螺絲刀的扭力調節螺母，通過測試儀顯示的數據，設定合適的輸出扭力(參考電動或氣動螺絲刀輸出扭力說明)。

■ 替換精度調節器的緩衝彈簧

(針對B系列附件)

■ TORQUE MEASURING PROCEDURES WITH THE FIDAPTOR

1. Set the Fidaptor in the socket of the meter and fit the bit receptacle of the screwdriver to be measured on the head of the Fidaptor
2. Set the switch of the screwdriver to REV and reverse the rotation to loosen the spring of the Fidaptor a little (using some finger strength).
3. Push the **[CLEAR]** button to display "0"
4. Set the switch of the screwdriver to FOR to rotate the screwdriver until it stops. (The spring is tightened)
5. When the screwdriver stops, the measuring value is held and digitally displayed on the Display Panel. The value is the output torque of the screwdriver.
6. After reversing the screwdriver rotation again to return the Fidaptor to the prescribed height, push the **[CLEAR]** Button to cancel the value. The output torque can be verified by repeating the above-mentioned operation (procedures 2 through 6) .To set torque, loosen or fasten the torque adjustment nut of the screwdriver and set it to the proper output by observing the reading of the tester referring to the approximate guide of output torque (Refer to "Handling Electric Screwdrivers").

■ REPLACING THE FIDAPTOR BUFFERING SPRING

(Accessory only for the B-X)

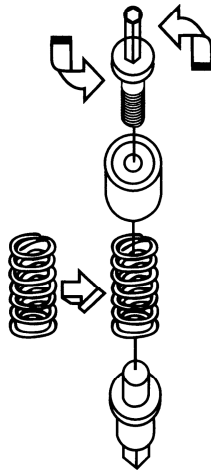


圖 4

B系列共有兩種彈簧，紅色（強硬）和藍色（軟弱），使用合適的彈簧以匹配扭力的強度，精度調節器本身配有藍色彈簧，當測量大扭力時，用紅色彈簧替換。（彈簧根據實際扭力情況須變換）

※ 反時針旋轉中軸，替換彈簧。

Two kinds of springs, red (strong) and blue (weak), are available for the B-X. Use the appropriate spring to match torque strength. A blue spring has already been attached with the Fidaptor. When measuring a higher torque, replace it with a red spring.

※ Turn the center axis counterclockwise to replace the spring.

■ 精度調節器的檢測

1. 定期更換精度調節器的推力軸承，若重復頻繁使用精度調節器，軸承會磨損，因而會失去平滑旋轉并引發測量精度退化。
2. 使用前檢查調節器，灰塵，缺少黃油或中軸彎曲都會降低測量精度。

■ INSPECTING THE FIDAPTOR

1. Replace the thrust bearings in the Fidaptor periodically. When you use the Fidaptor repeatedly, bearings will wear and become damaged, thereby losing their smooth rotation and resulting in deteriorated measurement accuracy.
2. Inspect the Fidaptor before you use it. Dust, absence of grease and bending in the shaft will degrade measurement accuracy.

■ 測力傳感器連接件(部件)

■ INTER-SHANK (accessory)

型號 Model	起子頭抓口的形態 Shape of bit receptacle	
IS-	軸耳	
IS-	軸耳	
IS-	軸耳	
IS-	六角軸耳	
IS-	六角軸耳	

圖 5

附加調節器頭的標準形狀是一個對邊 6.35mm 的軸耳,在待測螺絲刀頭抓口與軸耳不匹配時,可用互換軸耳做中間連接物。

The shape of the additional Fidaptor head is of 6.35 Hex Motive shank .when the bit receptacle of the screwdriver to be measured dose not match with the Motive shank, use the intershank as a medium to connect them.

互換接頭	形 狀	
BN-	方頭-方孔	
BN-	方頭-方孔	
BN-	方頭-方頭	
BN-	方頭-方頭	

圖 6

■ 測力傳感器使用方法

利用附屬物就可以測量除電動或氣動螺絲刀以外的其他工具的扭力,在設計附屬物時應注意下列幾點:

- ◆ 傳感器和附屬物應密合;
- ◆ 附屬物應足夠堅固耐用,不致于測量中壞掉;

■ USING THE SOCKET

By devising attachments, you use this tester to measure the torque of tools other than screwdrivers, Careful attention should be give to the following points when designing attachments:

- ◆ The socket and the attachment should fit each other firmly;
- ◆ The attachment should be durable en-

- ◆ 傳感器在垂直地面方向上的負重不超過10Kg;
- ◆ 不可給插座施加過載衝擊力。
- ※ 附加：遵守扭力儀的基本操作守則。

■ 扭力測量儀的校驗

數字扭力測量儀的測量部分均經過專門的結構設計能在相當長一段時間內維持穩定的測量精度，然而爲了更好地使用該儀器，每年一次的檢測較正是必要的，檢測可在用戶處進行，使用呆重量校驗杆(可供選擇)，當穩定良好的狀態不復存在時，可以交給當地的授權分銷商調整和修理，若故障的程度超過了當地的技術能力，生產商將負責修理該儀器。

■ 注意事項

- 不可使用超過最大允許負荷的扭力工具，以免損傷傳感器。
- 不要敲打或震擊儀器。
- 使用時確定傳感器處在自由放鬆狀態。
- 該儀器對環境較敏感，避免在下列地方使用該儀器：
 - ◇ 有水,油,或其他液體飛濺的地方;
 - ◇ 震動出現灰塵,熱空氣瀰漫的地區;
 - ◇ 在有電氣噪音的地區;
 - ◇ 高濕度環境(合適濕度爲35%-65%RH);
 - ◇ 高溫地區(合適溫度:15-40℃);

ough not to break down during measurement.

- ◆ The vertical load on the socket should be no more than 10kg;
- ◆ No impact should be imposed on the socket .
- ※ In addition, observe basic rules of the torque meters.

■ CALIBRATION OF TORQUE METER

The detecting element of the Motive Digital Torque Meter has a specially designed structure and maintains its stabilized load accuracy over a long period of time. However at least once a year inspection are required to get the beat use from the Tester. Calibration can be practiced by customers using a weight bar (optionally available). When a stabilized and correct state cannot be achieved by the customer, adjustment and repair will be carried out by local authorized distributors. When the jam is found exceeding local technical ability, the Tester will be repaired by the manufacturer.

■ HANDLING PRECAUTIONS

- Do not apply a torque above the maximum allowable load or damage will result;
- Don't tap or splash the meter.
- Make sure that the sensors are in freedom.
- The gauge is very sensitive to environmental conditions. Avoid using the Tester in the following places:
 - ◇ Where water, oil or other liquid may splash;
 - ◇ Where vibrations may occur and where dust or hot air may be emitted;
 - ◇ Our doors or where there are electric noises;
 - ◇ In high humidity (appropriate humidity of 35%-65%RH);
 - ◇ In high temperatures (appropriate temp-

●使用者還應注意以下幾點:

- ◇不要打開背後蓋子校驗各種電子元件;
- ◇不可把儀器存放在高濕度或寒冷的地方, 儀器在這類環境裏內部容易凝結水珠, 并使功能退化;
- ◇不可掄拋儀器, 或粗暴使用。

erature of 15-40°C).

●Where the environmental conditions may cause functional failure or degrade performance:

- ◇Do not open the rear cover to calibrate variable resistors or for any other reason;
- ◇Do not store the Tester under high humidity or in very cold places. Internal dew condensation is likely in such places and will deteriorate functions;
- ◇Do not drop the Tester or handle it roughly.

規 格:

型 號 Model NO.	B30		
測量範圍 Measurement range	Load1: 30.0-3.0N.m (30N.m) 306-30Kgf.cm 265-26Lbf.in	Load2: 5.00-0.1N.m (5N.m) 51.0-1.0Kgf.cm 44.2-1.0Lbf.in	Load3: 1.000-0.020N.m (1N.m) 12.24-0.140Kgf.cm 10.63-0.210Lbf.in
精 度 Accuracy	± 0.5%		
反應頻率 Responsive frequency	1000Hz		
電 源 Power source	AC220V 50Hz/60Hz或AC110V 50Hz/60Hz		
體 積 Dimensions (mm3)	240 × 220 × 80 (mm3)		
重 量 Weight	1.3Kg		

※ 如有技术改进, 恕不另行通知。

[MEMO]

型號 Mode NO.	B 400		
測量範圍 Measurement range	Load1:(400N.m) 400.0-40.0N.m 40.8-4.1 Kgf.m 147.6-14.7Lbf.ft	Load2:(100N.m) 100.0-10.0N.m 10.20-1.02Kgf.m 36.90-3.69Lbf.ft	Load3:(10N.m) 10.00-1.00N.m 1.02-0.10Kgf.m 3.69-0.37Lbf.t
精度 Accuracy	± 0.5%		
反應頻率 Responsive frequency	1000HZ		
電源 Power source	AC220V 50Hz/60Hz或AC110V 50Hz/60Hz		
備注	其余性能參考B30		

型號 Model NO.	B 3000		
測量範圍 Measurement range	Load1:(3000N.m) 3000-600N.m	Load2:(2000N.m) 2000-400N.m	Load3:(1000N.m) 1000-200N.m
精度 Accuracy	± 0.5%		
反應頻率 Responsive frequency	1000HZ		
電源 Power source	AC220V 50Hz/60Hz或AC110V 50Hz/60Hz		
備注	其余性能參考B30		

傳感器外形圖及引綫

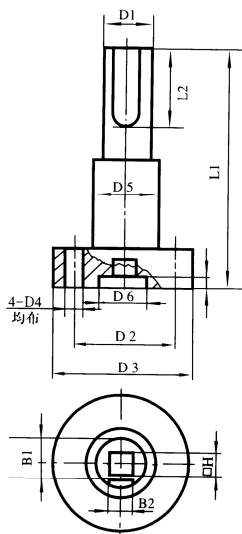


圖 8

備注：傳感器引綫長1.5米，為四芯屏蔽綫。
5芯插頭分別對應：

- 1# 電源+
- 5# 電源-
- 2# 輸出+
- 3# 輸出-
- 4# 空

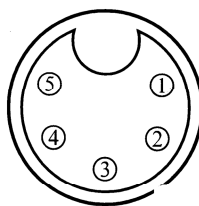


圖 7

型號 TYPE	B30	B400	B3000	
量程 (N.m) Measurement range (N.m)	1N.m 5N.m 30N.m	400N.m 100N.m	3000N.m 2000N.m 1000N.m	
外形 尺寸 (mm) Appearance dimension (mm)	D1	φ 30	φ 50	
	D2	φ 45	φ 80	
	D3	φ 59	φ 99	
	D4		φ 10.5	
	D5	φ 40	φ 58	
	D6	φ 22 ^{+0.05}	φ 40 ^{+0.05}	
	L1	85	155	
	L2	18	50	
	L3			
	L4			
	L5			
	L6			
	B1	26 ⁰ _{-0.2}	44 ⁰ _{-0.2}	67.5 ⁰ _{-0.2}
	B2	8	16	20
H	12.7	20	25.5	
H1				

附件清單:

編號 NO.	附件 Accessory	備注 Remarks
1#	精度調節器一只 (含藍色彈簧) Fidaptor × 1 (with blue spring)	替代彈簧一只 (紅色) Instead spring × 1 (red spring)
		紅色彈簧是強硬的 藍色彈簧是軟弱的 blue spring is strong White spring is weak 彈簧根據實際扭力 情況須變換
2#	互換軸耳五只 互換接頭四只 Types of inter-shanks × 5 Types of squares × 4	可定制 OEM Acceptable
3#	用戶手冊一份 合格證書一份 Owner's manual × 1 Certification × 1	

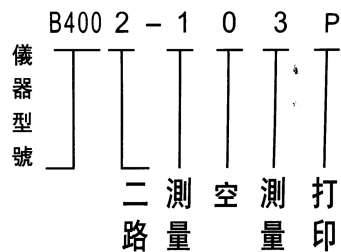
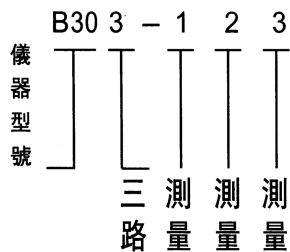
※ 以产品实物包装为准。

訂貨須知:

訂貨時須說明:

1. 選用型號
2. 幾路測量
3. 是否須加打印

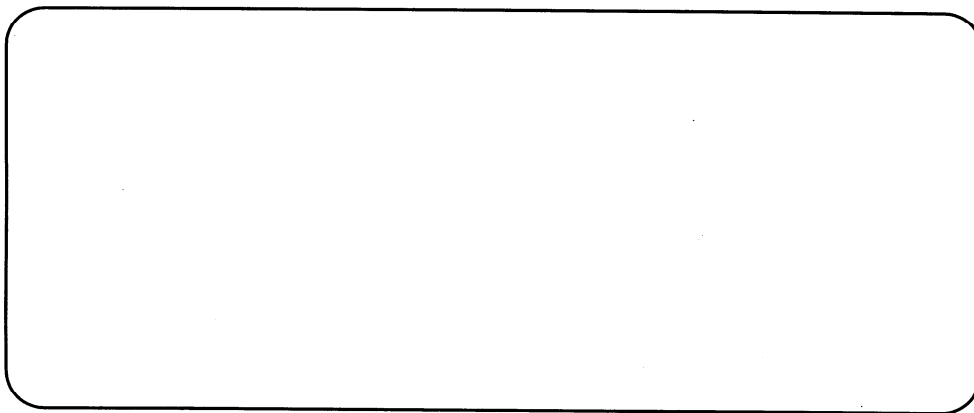
例如:



※ “0” 表示此通道不起作用

Authorized Dostribitors

授權經銷商



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