配料秤系统 MW96A

技术信息简介 P2

莫得威
ModWeigh

产品特点....FEATURES

- **优秀的计量及配料控制功能**
  FLOWRATE MEASUREMENT AND CONTROL FOR WEIGHFEEDERS
- **电机速度控制信号输出**
  MOTOR SPEED CONTROL OUTPUT SIGNAL
- **流量数据输出/反馈**
  FLOWRATE OUTPUT
- **可计量总累计量**
  MATERIAL TOTALISER
- **使用 Modbus 实现数据交换（独立的 RS232 及 RS485 接口）**
  MODBUS COMMUNICATIONS (INDEPENDENT RS232 AND RS485 PORTS)
- **系统软件可升级**
  FIELD SOFTWARE UPGRADES
- **电源 12-24 Vdc**
  12-24VDC POWER SUPPLY
- **系统精度优于 0.01%**
  OVERALL ACCURACY BETTER THAN 0.01%

MP2 INDICATOR

- **IP54 Facia**
- **2.8" (70mm) 彩色液晶显示屏**
- **320 x 240 像素**
- **Polyester film tactile keypad**
- **4-20mA output, 1 digital input & 2 digital outputs**

MO3 I/O for MP2

- **4 开关量输入**
  DIGITAL INPUTS
- **4 开关量输出**
  DIGITAL OUTPUTS
- **4-20mA 输入（或 0-10V）**
  4-20MA INPUT (OR 0-10V)
- **4-20mA output**

应用 APPLICATION

ModWeigh MW96 配料控制系统是用于称量及控制物料流量和累计重量的称量仪器.

A MODWEIGH MW96 WEIGH FEEDER SYSTEM IS USED TO MEASURE AND CONTROL THE FLOWRATE OF MATERIAL CARRIED BY A BELT CONVEYOR.

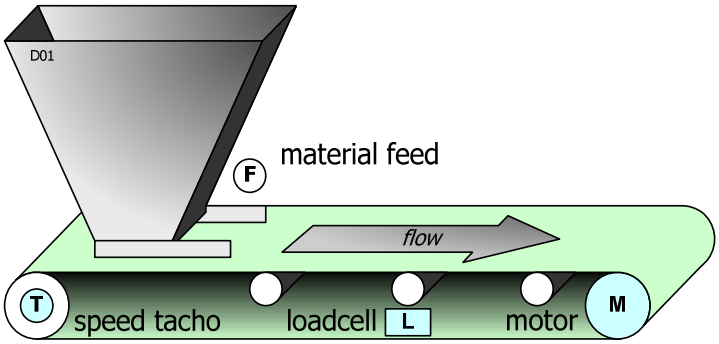
本仪表通过测量皮带载荷及皮带速度来计量物料的瞬时流量，并通过控制皮带速度来调节瞬时流量。

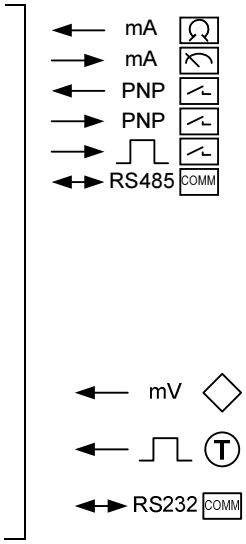
IT MEASURES THE BELT LOADING AND BELT SPEED AND CALCULATES THE MATERIAL FLOWRATE WHICH IT CONTROLS BY VARYING THE BELT SPEED.

ModWeigh 显示器 MODWEIGH DISPLAY

ModWeigh MW99d4 或 MD1 型流量显示器应用于标定系统及为系统提供准确的称量数据显示。本称重显示器采用图形显示，结合快捷设置菜单，简单易用。

A MODWEIGH FLOWRATE INDICATOR IS USED TO CALIBRATE THE SYSTEM AND PROVIDE A STATUS DISPLAY OF THE OPERATING SYSTEM. IT HAS A GRAPHICS DISPLAY WITH EASY TO USE MENU SELECTION OF SETTINGS.





功能特点 Features

基本 Basic

计量单位及数据采集率 Units & Resolution

用户可根据需要在列表中选择公制或英制变量（重量等）单位。可调的变量单位数据采集率，例如，100kg 可显示为 0.2kg 的增量。

The units for each variable type (weight etc.) can be selected from a list of metric and imperial units. The resolution of each variable type can be adjusted, this alters the count by e.g 100kg displayed in 0.2kg increments.

OIML（国际合法计量组织）设计 OIML Design

本设备按 OIML 认证标准设计制造。

The instrument is designed to OIML standards.

支持语言 Language Support

提供以下语言支持：英文，中文，韩文，德文，西班牙文，法文，意大利文，即波兰文。

Support is available for the following languages: English, Chinese, Korean, German, Spanish, French, Italian and Polish.

输入 Inputs

开关量输入 INx Digital Inputs INx

开关量输入可进行编程并匹配一系列功能包括"校零"，"打印"等。

The digital inputs are programmable to a range of function including 'acquire zero', 'print' etc.

直接及动态标定 Direct & Dynamic Calibration

直接标定是通过使用称重传感器额定量程及灵敏度来标定称重信号。动态标定允许皮带在运行条件下对已知称量段重量(kg)或皮带载荷(kg/m)进行称重标定。此功能特别适用于使用链码标定。

Direct calibration uses the loadcell capacity and loadcell sensitivity to calibrate the weight signal. Dynamic calibration allows calibration of the weight while the belt is moving knowing the platform weight (kg) or the belt loading (kg/m). This is useful when calibrating is done using chains.

流量设定点 Flowrate Setpoint

传送带应载物料量由流量设定点控制，控制仪将依本地或远程输入设定点进行流量调节。远程模拟信号设定点由第二组模拟量输入 AI2 提供支持。

The setpoint is the flowrate of material the belt conveyor should be carrying. The processor can control to the local setpoint, which is set using the keypad, or it can control to the remote setpoint. The second analog input AI2 is required for a remote analog setpoint.

模拟信号输入 AI2 可在 0-20mA 或 0-10V 范围内进行调节。如果系统未匹配远程设定点功能，此模拟信号输入也可用于其它功能。

The calibration of analog input (AI2) is fully adjustable over the range 0-20mA and 0-10V. If the remote setpoint is not used, the analog input is available for other functions.

测速传感器输入 Tacho Input

测速传感器用于测量皮带速度及运行状况，其基本标定是通过设置转速计常数来完成的。

The tacho input is used to measure the belt speed and belt travel. Basic calibration is done using a tacho constant setting.

系统可通过测量一段已知长度皮带在经过某一点所发出的脉冲信号数量对转速计进行标定。其它皮带长度也可以同样方法进行测量。

The system can be used to calibrate the tacho by measuring the number of pulses as a known length of belt passes a point. Other belt lengths can be measured in a similar manner.

校零/去皮 Zeroing

空载的皮带重量在经过一个完整的皮带周期后被平均，所得数值被纪录为动态零值。

The weight of the unloaded belt is averaged over one complete belt revolution and the resulting value is stored as the dynamic zero.

校零功能可以半自动化形式进行。控制仪可通过一项输出信号发出指令，停止物料输送；待皮带上无物料，系统即开始执行零值平均。当校零完成后，系统重新进料，并等待物料输送重量达到正常值，即恢复正常计控状态。

The zeroing can be semi-automated by using an output signal to stop the material feed onto the belt, waiting until the belt is empty, performing the zero averaging, restarting the feed and waiting until material has reached the weigh point before returning to flow control.

零点跟踪功能能够连续监视秤台重量，任何在称量段上小的物料堆积或偏差重量都会被自动清零。此功能确保了当皮带上无物料时，系统纪录为零流量。

Auto zeroing continuously monitors the platform weight. Any small drift in the weight measurement or material build up on the weigh platform is automatically zeroed out. This ensures that with no product on the belt, a zero flowrate is recorded.

信号过滤 Signal Filtering

重量信号过滤功能可以在减小秤体震动及仪表反应速度间进行调整以取得最佳折衷点。

Filtering for the weight can be adjusted to get the optimum compromise between reduction of plant vibration and response speed.

内部信号 Internal Signals

极限值 Limits

最高及最低极限值均可进行设置，编程及匹配操作其它内部信号。

The high and low limits have adjustable setpoints which may be programmed to operate on any internal signal.

批量模式 Batching

本系统可用于处理物料批量，当批量重量经过称重平台即停止传送带输送。此外，批量校正功能能够通过估计重量的方法，在目标重量达到前停止传送带以确保得到准确的批量。

The system can be used to batch out a desired weight by stopping the feeder when the batch weight has been totalised. A pre-act is available to compensate for overrun.

事件收集 Event Collection

系统可收集处理事件并提供给外部设备（PLC 或其它）。

Process events are collected for operation with external equipment (PLCs etc.)

循环调控 Loop Control

系统能够比较实际流量及设定点，PI 控制技术能自动控制马达速度命令信号以保证实际流量满足设定点要求。预给料功能保证了系统能够快速达到流量设定点要求，同时也能对设定点的改变作出迅速反应。

The processor compares the flowrate with the setpoint. A proportional/integral (PI) control technique with feed forward alters the motor speed demand signal to maintain the flowrate at setpoint. Feed forward allows the system to reach the desired set flowrate very quickly and also to respond to changes in setpoint rapidly.

容积计量模式 Volumetric Mode

在一般情况下仪表运行重量称量模式，自动调节速度命令信号以达到流量设定点要求。

Normally the controller operates gravimetrically and automatically adjusts the speed demand signal to reach the required flowrate setpoint.

在容积计量模式下，速度命令经由人工设定以控制流量。

In volumetric mode, the Speed Demand is set manually to control the flowrate.

高级控制设置 Advanced Control Settings

预给料功能设置可根据设备延迟（传送延迟）进行调整及修正。设置比率可根据设定点信号乘以控制比率百分比获得。

Feed forward settings can be adjusted and corrections for plant delays (transport delay) can be made. A ratio setting is available to multiply the setpoint signal by a percentage for ratio control applications.

记忆存储 Memory Storage

此功能可对一组设定值进行存储，并从存储中恢复设定值。此功能可存储不同的设定值用于不同的用途，系统可提供 20 个存储单元，每个存储单元可存储多达 4 个设定值。

Allows a group of settings to be stored or recalled from memory. This can be used for example to store settings for different products. There are 20 memory locations with up to 4 settings in each.

物料累计量 Material Total

系统累计量计数器能够计算出通过称量系统的物料总量。此累计量可清零，累计量脉冲输出可驱动外接计数器。累计量计数具备低流量切断功能，确保了过低流量不会导致错误计数，累计总重量数据保留不受断电影响。

The processor incorporates a totaliser which totalises the weight of material through the system. The totaliser can be reset to zero. A pulse output is available to operate external counters. A low flow cutout ensures that low flows do not cause false counts. The total is retained after a power failure.

累计量计数器位数可设置为 5，6，7 或 8 位。

The totaliser can be set to operate with 5, 6, 7 or 8 digits.

输出 Outputs

速度命令 Speed Demand

模拟输出速度命令信号用于驱动外置电机变频器，从而达到控制皮带速度目的。

An analog speed demand output signal is used to drive an externally connected motor controller to vary the belt speed.

物料流量 Material Flowrate

模拟输出流量信号可连接至其它设备。

An analog flowrate output signal is available for connection to other instruments.

模拟信号输入/输出缩放比例 Analog I/O Scaling

模拟输出信号可在 0 至 20mA 范围内进行调节。当使用 0 至 20mA 范围时，为达到相对 0 值，输出信号可略为负毫安。电压输出信号可通过在输出上连接电阻器获得。

The analog output range can be adjusted over the full 0 to 20mA range. The output will drive to a slight negative mA, allowing a live zero to be achieved when using a 0 to 20mA range. A voltage output is easily produced by connecting a resistor to the output.

模拟输出信号可任意在仪表内部信号中选择，例如，重量，流量等。

In addition the analog output signal is selectable to come from any internal signal in the instrument e.g weight, flowrate etc.

开关量输出 OUTx Digital Outputs

开关量输出功能能够进行编程以运行任意内部信号。这些信号包括了开关量输入状态，运行条件（运行，暂停等）及检测任何故障情况。此功能使得仪器接驳其它系统变得更简单。

The digital outputs are programmable to operate from any internal signal. These signals include the digital input states, status conditions (running, paused etc) and any fault conditions that are detected. This makes it easy connect into other systems.

通信 & 显示 Communications & Display

数据交换 Comms

本仪表提供独立的 RS232 及 RS485 通信接口，用于连接其它 ModWeigh 系统，或其它设备。例如，ASCII 输出协议可驱动打印机或 Modbus 进行更高层次的交互式通信，波特率及节点地址都可进行编程。

RS232 and RS485 ports are available. These are used to connect ModWeigh units together and also to connect to other systems. The protocol is either ASCII output for example to drive a printer or Modbus for interactive communications. Baud rates and node addresses are programmable.

打印及设计功能 Printouts & Macros

打印功能可通过按键操作或预设打印时间与周期来实现。数据能够连续输出以作为数据收集用途。打印数据经由 COM1 RS232 接口输出，打印内容可通过打印设计功能进行编辑。

Printouts can be triggered by a key press or set up to occur at set times during the day or week. Data may also be output continuously for data collection purposes. Data is output on the COM1 RS232 port. The content of the printouts is fully programmable using Macros.

设计功能可被用于自定义打印，也可用来执行算术计算。设计语言也包括更高级的编程条款。

Macros are programs used to customise printouts, but can also be used to perform arithmetic calculations. The Macro language also contains conditional terms for more advanced programming.

显示界面自定义 Display Customisation

键锁功能可被用来防止未经许可的仪表操作及限制进入操作菜单。可对任意键进行密码锁定，以防止未经授权的非法操作。当进行按键操作时，系统也可以提醒操作员进行操作确认。操作菜单可增添额外设置项或信号以满足用户自定义要求。

Locks may be set to prevent unauthorised use of the operator keys and restrict entry to the operator menu. The keys are individually lockable and optionally a passcode can be used to allow authorised operators to use the keys. Alternatively a confirmation of the key action can be requested.The operator MENU can be customised to make additional settings or signals available to the operator.

显示屏显示内容自定义适用于不同现场要求，显示屏既可显示全部参数，也可仅显示基本参数。

The contents of the main display can be set to suit any condition, from a comprehensive display showing all operating parameters to a simple display showing the basic signals.

与电脑连接 Computer Connectivity

ActiveX 控制组件使得 ModWeigh 系统与计算机间的通讯变得更加简单，典型应用是编程及搜集 VB 程序来实现计算机控制。

An ActiveX control is available to allow programmers to easily communicate with a ModWeigh instrument. Typically this can be used with a Visual Basic programme to collect and write data to the controller.

Feature Summary

	Digital Inputs (includes pulse input)	Digital Outputs (includes pulse output)	Isolated Pulse Output	Isolated 4-20mA Inputs	Isolated 4-20mA Outputs	Corner adjustment and balancing for 4 load-cells	Trade approvals (planned)
MP2,MO3	1+4	2+4	✓	1	2	×	×
MP2	1	2	✓	0	1	×	×

技术规格说明 SPECIFICATIONS

称重传感器输入 AI1 LOADCELL INPUT

输入范围 INPUT RANGE	±4 mV/V (0-20mV)
激励 EXCITATION	5 Vdc ±20 %, 250 mA 最大电流 (MAXIMUM CURRENT)
信号处理率 SIGNAL PROCESSING RATE	100 Hz (重量采集时间设定≤ 0.5 s) (RESPONSE TIME SETTING)
输入灵敏度 INPUT SENSITIVITY	0.5 µV/最大分度 (DIVISION MAXIMUM)
零值范围 ZERO RANGE	±3 mV/V (±15 mV)
调零温度系数 ZERO DRIFT	±0.02 µV+0.0005 % 典型恒载/°C (of deadload/°C typical)
满量程温度系数 SPAN DRIFT	±0.0005 %/°C 典型 (TYPICAL)
非直线性误差 NON-LINEARITY	‹0.002 % 之 FS (OF FS)
信号输入干扰系数 INPUT NOISE	0.15 µVp-p 典型 (TYPICAL)
滤波设置 FILTERING	0.04 s to 32.0 s 可调重量采集时间 (response time adjustable)
电压灵敏度范围 SENSE VOLTAGE RANGE	1-5 V

模拟量输入 AI2 ANALOG INPUT

4-20mA 输入电阻 4-20MA INPUT RESISTANCE	<60 Ω
0-10V 输入电阻 0-10V INPUT RESISTANCE	›100 kΩ
隔离 ISOLATION	在 50Vac 范围内电气隔离 GALVANICALLY ISOLATED TO 50VAC

模拟量输出 AO1 & AO2 ANALOG OUTPUTS

输出范围 OUTPUT RANGE	0 至 20 mA (-0.2 mA 至 21 mA, includes standard 4-20mA)
最大负载 MAXIMUM LOAD	1000Ω
数据采集率 RESOLUTION	0.4 µA
重量采集时间 RESPONSE TIME	称重传感器反应时间设置 + 20 ms (LOADCELL RESPONSE TIME SETTING)
电压输出 VOLTAGE OUTPUT	使用外置电阻器将电流转换为电压。 USE AN EXTERNAL RESISTOR TO CONVERT MA TO VOLTS. 例如，500Ω 电阻可将 20mA 转换为 10V。 FOR EXAMPLE 500Ω GIVES 10 V AT 20 MA.
非直线性误差 NON-LINEARITY	‹0.01 %
温度系数 DRIFT	‹2 µA/°C.
隔离	在 50Vac 范围内独立电气隔离

脉冲输入 IN0 - 输入频率 PULSE INPUT..FREQUENCY INPUT

最大范围 MAXIMUM RANGE	0.01Hz 至 4 kHz
典型操作范围 TYPICAL OPERATING RANGE	10 至 1000 Hz
最小脉宽 MINIMUM PULSE WIDTH	50us
高电压 HIGH VOLTAGE	› 8 V

低电压 LOW VOLTAGE	‹ 4 V
最大电压 MAXIMUM VOLTAGE	32 V
输入负荷 INPUT LOAD	4 kΩ 近似

开关量输入 INx （IN0 除外） DIGITAL INPUTS (EXCEPT IN0)

高电压 HIGH VOLTAGE	› 8 V
低电压 LOW VOLTAGE	‹ 4 V
最大电压 MAXIMUM VOLTAGE	32 V
输入负荷 INPUT LOAD	6 kΩ近似
输入类型 INPUT TYPE	PNP 输出传感器 PNP OUTPUT SENSORS

脉冲输出 OUT0 PULSE OUTPUT

最大输出电流 MAX OUTPUT CURRENT	50 mA
最大工作电压 MAX OUTPUT CURRENT	30V ac/dc MAX WORKING VOLTAGE
最大频率 MAX FREQUENCY	500 Hz
功率循环 DUTY CYCLE	50 % ±20 % (f › 0.5 Hz)
最大输出脉冲时间 MAX OUTPUT PULSE TIME	1000 ms (f ‹ 0.5 Hz)
隔离 ISOLATION GALVANICALLY ISOLATED TO 50 VAC	在 50Vac 范围内电气隔离

开关量输出 OUTx （OUT0 除外） (EXCEPT OUT0)

最大输出电流 MAX OUTPUT CURRENT	$\Sigma I_{IOx} < 0.25$ A
输出电压 OUTPUT VOLTAGE	与电源电压相同 SAME AS SUPPLY VOLTAGE

接口格式 COM1, COM2 COMMUNICATIONS

COM1 连接 COM1 INTERFACE	RS232
COM1 同步交换 COM1 HANDSHAKE	CTS 能够使用 CAN BE ENABLED
COM2/COM3 连接 COM2/COM3 INTERFACE	RS485
波特率 BAUD RATES	9600, 19200, 38400, 57600, 115200 (230400 开启 COM2)
设置 SETTINGS	8 位数据，无奇偶，2 停止位(8-N-2) 8 DATA BITS, NO PARITY, 2 STOP BITS (8-N-2)
协议 ON	Modbus RTU (MWBUS 开启 COM2)

基本规格 GENERAL

IP 等级 FACIA	IP20 (MP2 facia IP54)
工作温度 OPERATING TEMPERATURE	-10 至 45 °C
电源电压 SUPPLY VOLTAGE	10 至 32 Vdc
电源 MP2 TO	1.4 至 3.1 W
电源 MP2 + MO3 TO	3.4 至 5.0 W + P_{OUTx} + $P_{Tacho\ Excitation}$
MP2 Restrictions	$P_{Loadcell\ Excitation} + P_{AO1} + P_{AO2} < 1.5$ W

I_{Supply} < 0.5 A

仪表尺寸 DIMENSIONS

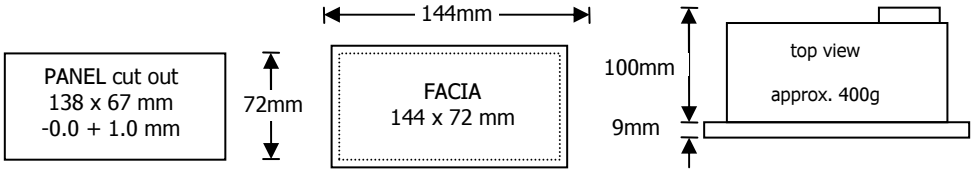
以下是整套控制系统所需仪表组件的安装尺寸。

FOLLOWING ARE THE DIMENSIONS OF THE HARDWARE ITEMS THAT MAKE UP THE SYSTEM.

显示器/控制仪设计为电控箱内安装。

THE DISPLAYS/PROCESSORS ARE DESIGNED FOR PANEL MOUNTING.

MP2 Processor



线路连接 CONNECTIONS

连接原理 CONNECTION PRINCIPLES

ModWeigh 仪表可以多种不同方式连接以适应不同现场要求。

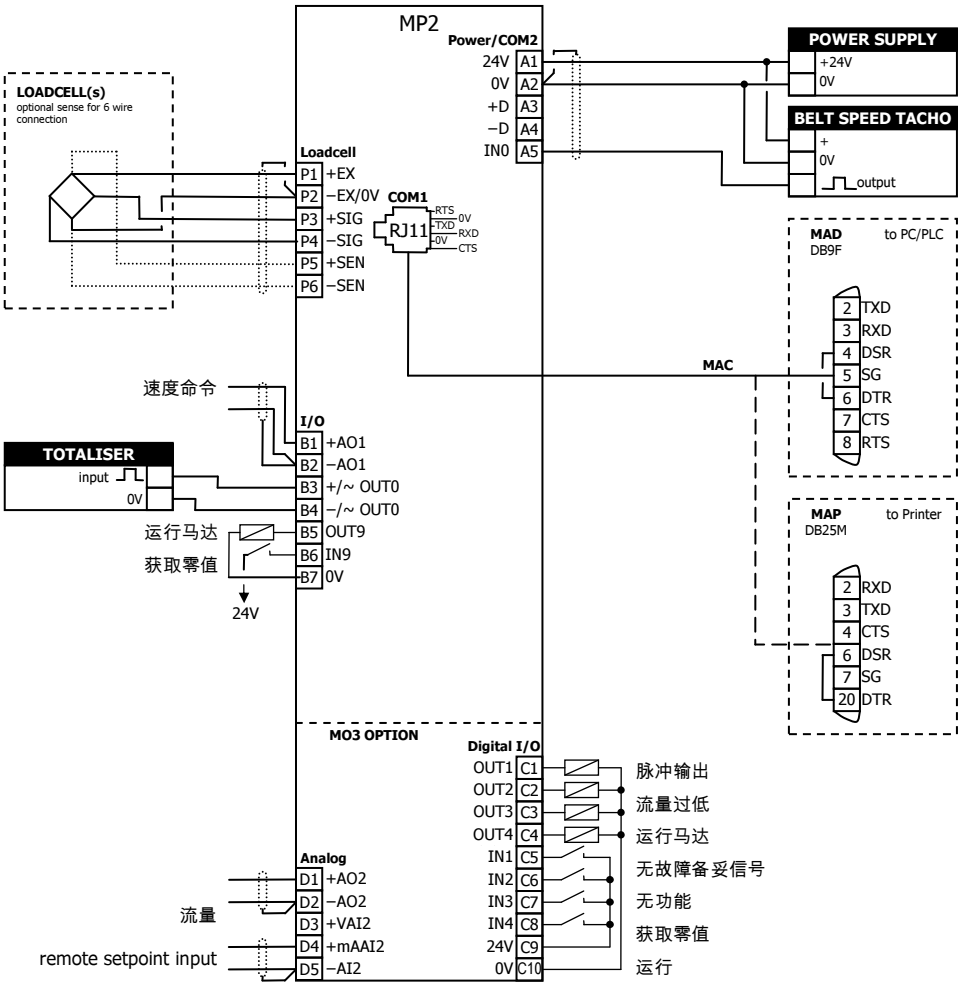
MODWEIGH INSTRUMENTS CAN BE CONFIGURED IN MANY DIFFERENT WAYS TO SUIT ANY GIVEN APPLICATION.

Connection Diagram – MP2

所有信号传输电缆须与电力供应电缆分开配线 KEEP ALL WIRING SEPARATED FROM MAINS WIRING

在标明处使用屏蔽电缆 USE SHIELDED CABLE WHERE INDICATED

使用 RUN 运行输入或 RUN MOTOR 运行马达输出 EITHER THE RUN INPUT OR THE RUN MOTOR OUTPUT SHOULD BE USED



订货 System Ordering

标准的 ModWeigh 系统是由一组不同的部件所组成。可以不同方式组成系统，但大部分应用都是从以下标准系统配置中进行选择。在订货时，须说明系统订货编号；如单独订购组件，则须说明所需部件名称。

A ModWeigh system is a group of ModWeigh parts that together form the system. Many possible systems can be created, but most applications will use one of the systems listed below. When ordering, just specify the system order code. To create a custom system, specify the individual components required.

配料秤系统	System Order Code
Product Key, Processor, IO	**MK96A,MP2,MO3**

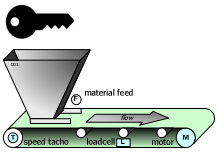
订购部件 Parts Ordering

以下是莫得威系统的部件订货编号列表。

Following is a list of order codes for the individual parts of a ModWeigh system.

The order code (and options) are shown below.

产品



select one of the following	
Product Key	**MK96A+CG**

Special Options

select any (or none) of the following	
Chinese manuals	**,CH**
Korean manuals	**,KO**
German manuals	**,DE**
Spanish manuals	**,ES**
French manuals	**,FR**
Italian manuals	**,IT**
Polish manuals	**,PL**
No manuals	**,NM**
Manufacturing certificate	**,MC**

Processor

select one (or none) of the following	
Loadcell processor	**,MP2**

IO Option

select one (or none) of the following	
digital IO - 4In 4Out, 1 x 4-20mA input & output	**,MO3**

附件

select one (or none) of the following	
RJ12 连线 2m (COM1 连线)	**,MAC**
RJ12 9 针 D-connector 适配器(ModWeigh 与 PC 连接)	**,MAD**
RJ12 25 针 D-connector 适配器(ModWeigh 与打印机连接)	**,MAP**
RS485 Line Terminator	**,MAT**

其它 ModWeigh 产品 Other ModWeigh Products

MW61 静态秤系统-称重传感器变送器/显示器。适用于平台秤，容器称量及大部分一般称量用途。
Weigher Systems – loadcells indicators. Suitable for scales, vessel weighing and most general weighing applications.

MW93 变重秤系统-适用于失重或增重流量控制系统。
Weight Change Systems – for loss-in-weight and gain-in-weight flow control systems.

MW94 冲板流量计系统-适用于测量连续流量的冲板计量系统。
Impact Weigher Systems – impact weigher processor for continuous flowrate measurement.

MW95 皮带秤系统-适用于连续性皮带物料称量系统。
Belt Weigher Systems – belt weigher processor for continuous flowrate measurement.

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(Document Details: g0 g1 g2 g3 g4 g5 g6 g7 g8 g9 g10 g11 g12 g13 g14 g15 v1 v2 v3 v4 MP2))