IMS Force Transducers
Proven Technology – Your Gain

The force transducers are developed and manufactured exclusively in Heiligenhaus. They are adapted optimally to their later place of use with the help of CAD and FEM systems. Thanks to modern fabrication techniques, special solutions and user-specific force transducers can also be manufactured in small numbers.

Special solutions, e.g. an integrated support bearing, make possible the implementation of systems for applications where it has not been possible so far to install measuring equipment, e.g. for space reasons. The tailormade solutions from IMS enable use, in particular, where older systems need to be replaced. They reduce the amount of work required on site to a minimum, thereby also shortening the downtime.

It is also possible to replace older systems step by step so that the measuring electronics are replaced in the first phase and later then also the force transducers. This option reduces the actual investment sum and provides security in case of failure.

We work continuously on developing the systems further and keeping them up to date. We have further forward-looking developments in the pipeline:
• Development of special rolling force measurement systems
• Development of customer-specific weighing and force measurement systems
• Introduction of an electronic data sheet for the force transducer to prevent incorrect configuration of the electronics
• Operation of the measuring amplifier via Bluetooth and an app
• Integration of a web server in the measuring electronics

You can also find brochures on other products in the download section of our internet site at www.ims-gmbh.de.

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**Force Measurement Systems from IMS**

**Your Guarantee of Quality**

Modern production equipment is designed for high productivity and quality. To achieve these aims, it is essential that the production parameters are compliant with exacting standards. For this reason, force measurement systems are used, for example, in the steel, aluminum, paper, and plastic industries to control strip and web tension, among other applications. IMS force measurement systems offer the highest levels of precision as well as reliability, flexibility and long service life for your quality management purposes. They consist of at least one force transducer and one electronic evaluation unit.

**Features of IMS force transducers:**
- High dynamics and precision even at very fast reaction to force changes.
- The integrated calibration signal makes a reference measurement on site unnecessary. This facilitates commissioning.
- Manufacturing in accordance with the customer’s specific requirements ensures easy installation and assembly compatibility.
- High overload capacity (standing allows up to 20 times the nominal load). These forces in wire resistance strain gauge technique are passive systems that do not generate their own signals. An electronic evaluation unit is therefore needed to capture and evaluate these forces. The IMS measuring amplifier MMV was developed especially for this task. This changes the resistance value of the strain gauges, which is then converted to a voltage change.

**Measuring Amplifier Type MMV**

The modular MMV measuring amplifier is delivered in rugged stainless steel enclosure. It is suitable for connection of all IMS force transducers based on the wire resistance strain gauge technique.

**Basic configuration:**
- Two 16-bit input channels for IMS force transducers
- Two 16-bit analog outputs (optionally current or voltage)
- Measurement speed up to 1000 measurements per second
- Four digital inputs and outputs
- 24 VDC power supply
- Enclosure dimensions: 300 x 350 x 80 mm

**Optional extras:**
- More power supply (100 – 240 VAC / 50 – 60 Hz)
- Flexible field bus system for all common types, e.g. EtherCAT and Profinet DP
- Customer-specific firmware possible

**Flexible Use**

The output signal from the force transducer is fed to the A/D converter via an instrument amplifier. The signal is assessed by software. Due to digitalization, the measuring amplifier is very user-friendly and flexible in use. Thanks to the modular design, the amplifier may be extended without problem by two further input signals without affecting the measurement.

**Features of IMS force transducers:**
- Even more flexibility with field bus system.
- Analog outputs can be set either as current or voltage outputs.
- The force transducer is fed directly to the customer’s side. The measuring amplifier can be equipped optionally with a field bus system. An A/D converter board for EtherCAT and Profinet DP is supported. The field bus system is therefore used, not only to output measured values but also to supply the necessary control data. The measuring amplifier can then be operated as the field bus system.

**Idea for Restretching**

This is beneficial when replacing older measuring amplifiers as the existing transducers are not needed. The measuring amplifier can also be replaced at a cost.

**Quick and Easy Configuration**

The measuring amplifier can be configured and started up from the control panel in a few steps. The full range of measuring systems are supplied pre-configured. The customer commissioning work is thereby reduced to a minimum. The optional configuration program "MMV Configurator" is available as an optional service. Running under Windows, it simplifies configuration of the IMS measuring amplifier and enables archiving of the configuration data and offline editing of them.
Modern production equipment is designed for high productivity and quality. To achieve these aims, the principles of stress and deformation measuring parameters are complied with exactly. For this reason force measurement systems are used, for example, the steel, aluminium, paper and plastic industries to measure strip and web tension, among other applications. IMS force measurement systems offer the highest levels of precision as well as reliability, flexibility and long-time use for your quality management purposes. They consist of at least one force transducer and one electronic evaluation unit.

Precise – Dynamic – High-Speed Response

The force transducers – preferably made of steel or aluminium bellows – are manufactured to customer requirements. The bellows is equipped with wire resistance strain gauges and can be deformed elastically at predefined points, the measurement zones, when a force is exerted on it. This changes the resistance value of the strain gauges, which is then converted to a voltage change.

Features of IMS force transducers:

- High dynamics and precision as well as fast reaction to force changes
- The integrated calibration signal makes reference measurement on site unnecessary. This facilitates commissioning.
- Manufacturing in accordance with the customer’s specific requirements ensures easy installation and simplified commissioning.
- High overload capacity (stand-by up to eight times the nominal load, optionally up to 20 times the nominal load).
- Force transducers in new resistance strain gauge technique are passive systems that do not generate their own signals. An electronic evaluation unit is therefore needed to capture and evaluate the force signals. The IMS measuring amplifier MMV was developed especially for this.

The modular MMV measuring amplifier is delivered in a rugged stainless steel enclosure. It is suitable for connection of all IMS force transducers based on the wire resistance strain gauge technique.

Basic configuration:

- Two 16-bit input channels for IMS force transducers
- Two 16-bit analog outputs (optionally current or voltage)
- Measurement speed up to 1000 measurements per second
- Four digital inputs and outputs
- 24 VDC power supply
- Enclosure dimensions: 300 x 350 x 80 mm

Optional extras:

- Mains power supply (100 – 240 VAC / 50 – 60 Hz)
- Flexible field bus system for all common types, e.g. EtherCAT and Profinet
- Customer-specific firmware possible

Flexible Use

The output signal from the force transducer is fed to the A/D converter via an instrument amplifier. The signal is adjusted by software. Due to digitalisation, the measuring amplifier is very user-friendly and flexible in use. Thanks to the modular design, the amplifier may be extended without problem by two further input signals without affecting the measurement.

To make this possible, the four digital inputs and outputs enable flexible adaptation of the MMV measuring amplifier to the specific measuring task even if a field bus system is not available. Use of the amplifier is therefore also beneficial when replacing older measuring amplifiers as the existing force transducer (in wire resistance strain gauge technique) do not also need to be replaced as a result.

Even More Flexibility with Field Bus System

The analog outputs can be set either as current or voltage outputs and must be loaded electrically on the customer’s side. The measuring amplifier can be equipped optionally with a field bus system. A common field bus systems (such as EtherCAT and Profinet) are supported. The field bus system can be used not only to measure measurement values, but also to control other apparatus and an instrument amplifier. The measuring amplifier can also be operated as a field bus system.

Ideal for Retooling

This four digital inputs and outputs enable flexible adaptation of the MMV measuring amplifier to the specific measuring task even if a field bus system is not available. Use of the amplifier is therefore also beneficial when replacing older measuring amplifiers as the existing force transducer (in wire resistance strain gauge technique) do not also need to be replaced as a result.

Quick and Easy Configuration

The measuring amplifier can be configured according to customer requirements. Use of the amplifier is therefore also beneficial when replacing older measuring amplifiers as the existing force transducer (in wire resistance strain gauge technique) do not also need to be replaced as a result.

The program “MMV Configurator” is available as optional extra. Running under Windows, it simplifies configuration of the IMS measuring amplifier and enables archiving of the configuration data and offline editing of them.

The optional extras are particularly beneficial when replacing older measuring amplifiers as the existing force transducer (in wire resistance strain gauge technique) do not also need to be replaced as a result.

Measuring Principle

To measure these forces, force transducers are inserted between the plunger block of the deflection roller and the machine foundation. The signals of the force transducers are then digitalized in the IMS measuring amplifier of the type MMV. The strip or web tension is calculated taking the deflection angle of the deflection roller into account. The output signals are made available for further processing.

F strip tension

F resulting from strip tension

F measuring force

The choice of which force transducer is suitable for a particular application depends on various factors, e.g. the mounting position, strip run and the weight force from the weight roller. In such cases, please contact the IMS technical support.

Ideal for Retrofitting

Ideal for Retrofitting

The support bearing used can be mounted directly to the force transducer without a adapter plate. The materials used lend the force transducers high spring stiffness, which ensures slip-proof operation.

Measuring Amplifier Type MMV

The analog outputs can be set either as current or voltage outputs and must be loaded electrically on the customer’s side. The measuring amplifier can also be operated via the field bus system. All common field bus systems (such as EtherCAT and Profinet) are supported. The field bus system can be used not only to measure measurement values, but also to receive information, e.g. coil diameter. The measuring amplifier can be equipped optionally with a field bus system.
Force Measurement Systems from IMS
Your Guarantee of Quality

Modern production equipment is designed for high productivity and quality. To achieve these aims, it is of crucial importance that the production processes are carried out with precision. For this reason, force measurement systems are used, for example, for the steel, aluminum, paper and plastic industries to measure strip and web tension, among other applications. IMS force measurement systems offer the highest levels of precision as well as reliability, flexibility and long service life for your quality management purposes. They consist of at least one force transducer and one electronic evaluation unit.

Precise – Dynamic – Flexible – Responsive

The force transducers – preferably made of steel or aluminum bellows – are manufactured to customer requirements. The bellows is equipped with wire resistance strain gauges and can be deformed elastically at pre-defined points, the measurement zone, when a tension is exerted on it. This changes the resistance value of the strain gauges, which is then converted to a voltage change.

Features of IMS force transducers:

- High dynamics and precision as well as fast reaction to force changes
- The provveded calibration signal makes it easy to measure on site, in situ and offline
- Manufacturing in accordance with the customer’s specific requirements ensures easy installation and simplified commissioning
- High overcapacity (up to 20 times the nominal load) optionally up to 30 times the nominal load

Force transducers in wire resistance strain gauge technique are passive systems that do not generate their own signals. An electronic evaluation unit is therefore needed to capture and evaluate the force signals. The IMS measuring amplifier MMV was developed especially for this.

The modular MMV measuring amplifier is delivered in an audiophonic steel enclosure. It is suitable for connection of all IMS force transducers based on the wire resistance strain gauge technique.

Type MMV

Basic configuration:

- Two 16-bit analog outputs
- Two 16-bit analog outputs (optional current or voltage
- Measurement speed up to 1000 measurements per second
- Four digital inputs and outputs
- 24 VDC power supply
- Enclosure dimensions: 300 x 350 x 80 mm

Additional properties:

- Mains power supply (100 – 240 VAC / 50 – 60 Hz)
- Flexible field bus system for all common types, e.g. EtherCAT and Profinet-OD
- Customer-specific firmware possible

Flexible Use

The output signal from the force transducer is fed to the A/D converter via an instrument amplifier. The signal is adjusted by software. Due to digitalisation, the measuring amplifier is a very user-friendly and flexible unit. In this case, the measurement amplifier can be extended without problem by two further input signals without affecting the measurement.

Measuring Amplifier Type MMV

Measuring amplifier (per 6 MMV)

Even More Flexibility with Field Bus System

The analog outputs can be set either as current or voltage outputs and must be isolated electronically on the customer side. The measuring amplifier can be equipped optionally with a field bus system. A common field bus system such as EtherCAT and Profinet-OD are supported. The field bus system can be used not only to input measured values but also to control the measurement amplifier as well as to control the measurement amplifier indirectly. The measuring amplifier can be operated as a field bus system.

Ideal for retrofitting

This four digital inputs and outputs enables flexible adaptation of the MMV measuring amplifier to the specific measuring task even if a field bus system is not available. Use of the amplifier is therefore also beneficial when replacing older measuring amplifiers as the existing measurement technique (if wire resistance strain gauge technique) do not also need to be replaced as a result.

Quick and Easy Configuration

The measuring amplifier can be configured and started up from the control panel in a few steps. This reduces commissioning work to a minimum. The software program “MMV Configurator” is available as optional version. Running under Microsoft Windows, it simplifies configuration of the MMV measuring amplifier and enables archiving of the configuration data and offline editing of them.

The material used lends the force transducers high spring stiffness, which ensures strip-run stability. It is necessary in the continuous production of steel, aluminum, paper or foil to measure the tension in the strip or various components of a production line. Only then it is possible to achieve a consistent standard of quality. Since it is not possible to measure the tension directly in the strip, it is determined indirectly. To this end, the strip is diverted around a deflection roller and the resultant bearing reaction force is measured.

Force Measurement Systems in Use

It is necessary in the continuous production of steel, aluminum, paper or foil to measure the tension in the strip or various components of a production line. Only then it is possible to achieve a consistent standard of quality. Since it is not possible to measure the tension directly in the strip, it is determined indirectly. To this end, the strip is diverted around a deflection roller and the resultant bearing reaction force is measured.
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Thanks to modern fabrication techniques, special solutions and user-specific force transducers can also be manufactured in small numbers.

Special solutions, e.g. an integrated support bearing, make it possible to implement systems for applications where it has not been possible so far to install measuring equipment, e.g. for space reasons. The tailor-made solutions from IMS enable use, in particular, where older systems need to be replaced. They reduce the amount of work required on site to a minimum, thereby also shortening the downtime.

It is also possible to replace older systems step by step so that the measuring electronics are replaced in the first phase and later then also the force transducers. This option reduces the actual investment sum and provides security in case of failure.

We work continuously on developing the systems further and improving them up to date. We have further forward-looking developments in the pipeline:

- Development of special rolling force measurement systems
- Development of customer-specific weighing and force measurement systems
- Introduction of an electronic diploma for the force transducer in order to prevent incorrect configuration of the electronics
- Operation of the measuring amplifier via Bluetooth and an app
- Integration of a web server in the measuring electronics

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