



InTrac 78X

Instruction Manual

Product and maintenance log

Product name: _____

Article no.: 30 261 244

Product identifier no.: InTrac78 __/__/__/__/__/__

Serial no.: _____

A logbook of activities should be maintained for the above-mentioned product, recording all data about events, adopted measures, manipulations etc. relative to the product, such as checking of the shipment, initial installation, service/maintenance, repair work, startup and shutdown etc.

How to use this instruction manual

This Instruction Manual is an integral part of the METTLER TOLEDO retractable housing InTrac 78X and contains notes and instructions that are important for safety and operation.

All persons working on or with the InTrac 78X must have first read and understood the sections appropriate to the work in hand.

Please read this instruction manual carefully before using the InTrac housing. Keep this document close to the unit, so that operating personnel may easily be able to refer to it at any time.



Caution! Please first read Chapter 1 "Introduction" on page 9 and Chapter 2 "Important notes for housing uses in Ex-Classified area" on page 22.

Proprietary designations

The following are proprietary names and, for the sake of simplicity, will be mentioned in this instruction manual without the registration marking, e.g. ®.

- InTrac, InPro, InFlow, EasyClean and InFit are registered trademarks of METTLER TOLEDO Group.
- Viton® and Kalrez® are registered trademarks of DuPont.
- All other trademarks are the property of their respective holders.

Use of warnings and symbols



DANGER! Warning of a dangerous situation that can lead to extensive material damage, to death or grave bodily injury.



CAUTION! Warning of a possible dangerous situation that can lead to light bodily harm and/or material damage.



ATTENTION! Information referring to technical requirements. Non-adherence can lead to malfunctions, uneconomic working and possibly also to loss of productivity. The manufacturer is not liable for any damages resulting from improper or inappropriate use.

Explanation of housing designations

The designation InTrac 78X used in this Instruction Manual covers reference to the following housings:

- **InTrac 781** for pH/redox electrodes, O₂ and conductivity sensor (with diameter 12 mm and PG13.5 thread).
- **InTrac 784** for pH/redox electrodes with liquid electrolyte e.g., InPro 2000 or 465 sensor series.

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1 Introduction

- The retractable housing InTrac 78X is safe to operate. When used correctly, it represents no danger.
- Before starting to use the housing, carefully read this instruction manual: the safety precautions and warnings contained in it must be observed.
- The retractable housing has been tested in-house and dispatched ready for installation.

In addition to this instruction manual please also note the following:

- all local safety regulations concerning the execution of pneumatic and water installations.
- all instructions and warning remarks in the publications of the products that are used in conjunction with the retractable housing (electrodes, sensors, controls, etc.).
- all safety precautions for the plant into which the retractable housing will be installed.
- all instructions and warnings labeled on the retractable housing.
- all safety information relative to operation in potentially explosive atmospheres/hazardous areas (Ex classified zones).

The instruction manual contains the most important information for using InTrac 78X efficiently and in accordance with regulations. A basic condition for safe handling and operation without malfunctions is a knowledge of these safety instructions and observance of the further warnings in the instruction manual.

This instruction manual, and in particular the safety regulations, are intended for personnel entrusted with the operation and maintenance of the retractable housing. It is assumed that these persons are familiar with the equipment in which the retractable housing is installed. Therefore, before any work is started with the retractable housing, this instruction manual must be read and understood by those persons involved.

The instruction manual must be stored where it is constantly accessible and available to any person working with the InTrac 78X.

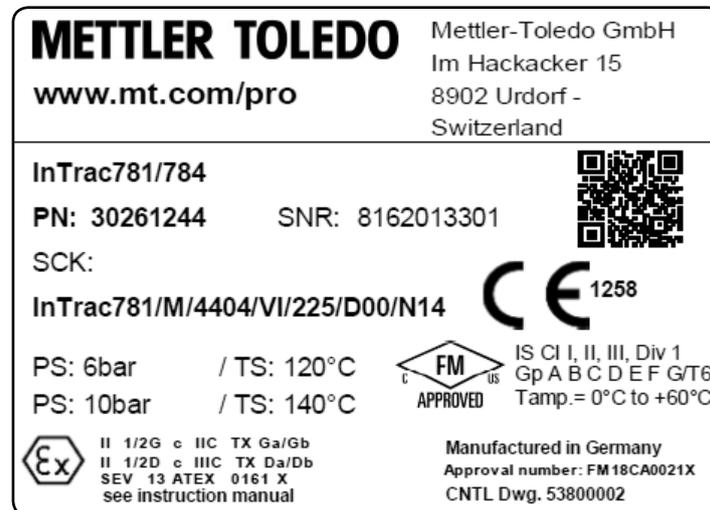
On receipt of the shipment, check immediately:

- the retractable housing and accessories for any sign of transport damage. Report any damage immediately to the carrier and to your supplier.
- the type designation on the housing body.
- for completeness of the supply. Please notify your supplier immediately if the shipment is incomplete or in any way incorrect (see Chapter 3.1 "Scope of delivery" on page 28).

1.1 Housing designations

Housing designation, product identifier no. as well as article no. and serial no. for clear identification when communicating with the manufacturer can be noted from the type plate.

Example InTrac 781 and InTrac 784 housing type plate



Note: The material number; (30261244) is the same for both InTrac 781 and/or InTrac 784 housings. However, the product Smart Configuration Key (SCK) and serial number (SNR) are different for every retractable housing.

1.2 Basic principles

The retractable housing InTrac 78X is built in accordance with state-of-the-art technology and recognized technical safety regulations.

However, the housing can be a source of risks and dangers:

- if the housing is operated by underskilled or unauthorized personnel.
- if the housing is not used in compliance with regulations and/or stipulations for appropriate use.

InTrac 78X may only be used in a technically correct condition for the purpose intended by the supplier, with awareness by the user of safety and danger factors, taking the instruction manual and local safety regulations into consideration.

Malfunctions and damage that can affect the safety and function must immediately be remedied by the operator or an expert, and notified to the manufacturer in writing!



DANGER!

A defective retractable housing must neither be installed nor put into operation. Faulty containment and installation out of conformance with regulations and instructions can lead to the escape of medium or to pressure surges (explosion), potentially harmful both to persons and to the environment.

1.3 Warning notices and symbols

The following symbols are used in this instruction manual to mark safety instructions:

-  **DANGER!** Warning of a dangerous situation that can lead to extensive material damage, to death or grave bodily injury.
-  **CAUTION!** Warning of a possible dangerous situation that can lead to light bodily harm and/or material damage.
-  **ATTENTION!** Information referring to technical requirements. Non-adherence can lead to malfunctions, uneconomic working and possibly also to loss of productivity.

1.4 Responsibilities, organizational measures

1.4.1 Responsibilities of operator

- The operator is under obligation only to permit persons to work with InTrac 78X retractable housings, who are familiar with the basic requirements of work safety and accident prevention, and who have been instructed in the handling of the housing. This instruction manual serves as the basic document.
- In addition to the instruction manual there are also generally valid legal and other binding regulations for work safety and accident prevention as well as for environmental protection, and these must be provided by the operator and instructed to personnel using the housings.
- The operator/user must be fully aware of safety and potential danger factors during work with the housings and this awareness must be checked by the operator at regular intervals.
- Measures must be taken to ensure that the retractable housings are only operated in a safe and fully functional condition.
- If the housings are employed in hazardous areas, compliance with prevailing regulations is to be ensured.

-  **CAUTION!** Before the retractable housing is put into operation, the operator must have already clarified that use of the housing in conjunction with the other associated equipment and resources is fully authorized.

1.4.2 Responsibilities of personnel

- All persons whose duty it is to operate the retractable housings are under obligation to read Chapter 1 "Introduction" on page 9 and Chapter 2 "Important notes for housing uses in Ex-Classified area" on page 22 as well as the warning notices in this instruction manual.
- In addition to the instruction manual, generally valid legal and other binding regulations for work safety and accident prevention must be adhered to.
- Any method of working which is doubtful from a safety perspective and which exceeds the operation according to regulations must be omitted.
- Avoid using high-pressure water jets to clean any parts and components of the housing.

-  **ATTENTION!** Before every start-up, the retractable housing must be checked for:
- damage to the connections, fastenings, etc.
 - leakage
 - perfect functioning
 - authorization for use in conjunction with other plant equipment and resources.

-  **DANGER!** A defective retractable housing may neither be installed nor put into operation. Faulty containment or installation out of conformance with regulations and instructions can lead to the escape of medium or to pressure surges (explosion), potentially harmful both to persons and to the environment.

1.4.3 Selection and qualifications of personnel – basic duties

- Work on or with the retractable housings may only be carried out by reliable and appropriately trained or instructed personnel. The personnel must have read this instruction manual in advance.
- Clear responsibilities/standard operation procedures (SOPs) must be established for the personnel entrusted with operation, service, repair, etc. of the housings.
- It must be ensured that only specifically assigned personnel may operate the housings.

-  **DANGER!** Incorrect manipulation or operation of the housings or non-observance of safety regulations can lead to problems with the housings and to the escape of process medium, thereby presenting a potential hazard to the environment, personnel and material.

1.5 Product-specific hazards

1.5.1 Sensor design

-  **DANGER!** The electrode or sensor may only be removed from a mounted retractable housing when this is in the "Service" (retracted/withdrawn/maintenance) position, since if the electrode/sensor is missing from the housing, there is potential path for the process medium to escape to the environment.

This can endanger personnel and cause damage to the environment and material. Toxic or aggressive media can pose a threat to human life through poisoning, chemical burns or scalding.

-  **ATTENTION!** If an electrode/sensor is broken, it must be replaced immediately.

-  **DANGER!** A broken sensor jeopardizes process safety, since it is not then possible to achieve reliable measurement results.

 **ATTENTION!** The intelligent sensor locking system, modular manual drive train device and the visualized sensor interlocking bolts in the manual retractable housings (InTrac 78XM) makes it difficult for any unintentional removal of the electrode/sensor from the housing when in the "Measure" position. This locking feature is basically intended as an added safety feature for the device. However, the operator/user must be fully aware of safety and potential danger factors during work with the housings and this awareness must be checked by the operator at regular intervals.

Principally, personal protective equipment such as protective goggles and clothing must be worn.

Any manipulation of the electrode/sensor may only be carried out when the retractable housing is in the "Service" (retracted/withdrawn/maintenance) position.

"Service" or "Measure" position of the InTrac 78XM housings



Note: The sensor interlocking bolts indicate the operation mode (for manual retractable housing – InTrac 78XM model only)

1.6 Manipulation of and maintenance work on the housings

 **ATTENTION!** Before dismantling a retractable housing or commencing any maintenance work on it, ensure that the equipment in which the retractable housing is installed is in a safe condition (depressurize, no explosion risk, empty, rinse, vent, etc.). Retractable housings may only be stripped down after having been completely dismantled.

Manipulation of the housings may only take place after it has been ensured that no process medium can escape through the housing in the event of incorrect manipulation.

For this reason, the complete system must be emptied and vented in advance (**safe condition**).

If the retractable housing has been in operation in conjunction with the automated cleaning and calibration system EasyClean, it must be ensured that before any manipulation of the housing, the EasyClean system has been completely switched off and isolated (power, compressed air and water).

It is principally necessary to wear personal protective outfit such as protective goggles and clothing.

Only such maintenance and repair work as is specifically described in this instruction manual may be performed on the retractable housing.

Only original spare parts from METTLER TOLEDO may be used for replacing defective components.



DANGER! Non-compliance with the prescribed maintenance instructions can endanger personnel and the environment.

1.6.1 Polymer housings



ATTENTION!

- Retractable housings made of polymer material do not have the same mechanical properties as steel housings.
- Retractable housings made of polymer need more frequent servicing than steel housings.
- Defective components may only be replaced by an authorized service center.



DANGER!

Polymer housings may not be used in applications subject to high mechanical stress, as this could lead to collapse of the protective caging. In such case, process liquid would be able to access the flushing chamber, resulting in process medium mixing with cleaning medium. Please see Chapter 1.6.2 "Installation in pressurized systems" on page 15 for recommended maximum permissible temperature and pressure.

1.6.2 Installation in pressurized systems



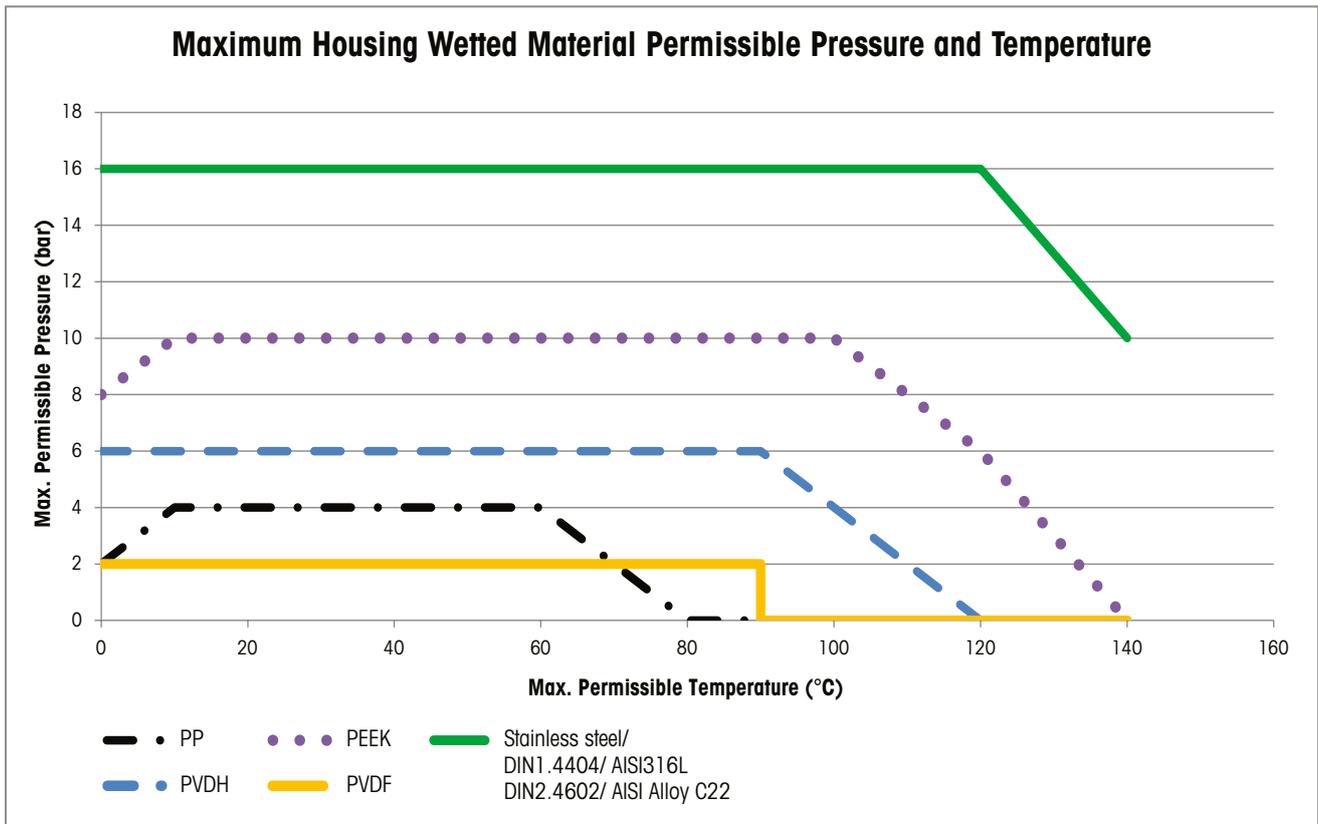
ATTENTION!

The maximum permissible temperature and pressure specifications must not be exceeded. The values depend upon the design and type of the retractable housing. The relative specifications are given on the type plate of the individual housings. Please note that the maximum permissible pressure and temperature may differ depending on the process medium. Please consult your local METTLER TOLEDO representative for more information.



DANGER!

If temperature and pressure limits are exceeded, there is a risk to the integrity of the system, thereby presenting a potential threat to human life and to the environment.



1.7 Installation in potentially explosive areas (hazardous areas)

ATTENTION!

- Please consult and follow the drawings and diagrams supplied with the measuring system.
- Where appropriate, it should be considered to include the METTLER TOLEDO retractable housing InTrac 78X and the process connections in your recurring pressure test program for the complete plant as a whole.
- Before the retractable housing is put into operation, the operator must have already clarified beyond doubt that use of the housing in conjunction with the other associated equipment and resources is fully authorized.
- Please note that for plastic type of retractable housing; not all metallic parts are electrically connected. Hence, all metal part of retractable housing InTrac 78X and the process connections must be connected to the main potential equalization system of the plant (grounded). The grounding cable (see drawing) has to be installed by the operator.
- Potential electrostatic charging hazard to the housing flange and wetted parts. Proper discharge is needed before carrying out housing installation or after service, and/or removing from the process.
- In special applications, the minimum conductivity of the medium (in contact with the housing wetted part) shall be more than 1 nS/cm.



DANGER!

Non-observance of legal regulations concerning use in hazardous areas can endanger human life and the environment.



ATTENTION!

See also Chapter 2 "Important notes for housing uses in Ex-Classified area" on page 22.

1.8 Residual hazards

 **ATTENTION!** Despite all precautionary measures taken, residual hazards still remain.

1.8.1 Rupture of pneumatic or hydraulic connections

 **DANGER!** The escape of aggressive medium can present a threat to human life and to the environment.

1.8.2 Leaky connections

- Connections can become loosened through the effects of vibration.
- Never remove the lower and top housing clamp screws during operation.
- Never remove the sensor/electrode when the housing is in the “Measure” position. Visually check the housing position level and ONLY remove the sensor when it is fully retracted from the process or in the “Service” position.
- The connection between housing and process adaptor is a potential source of leakage.

 **ATTENTION!** The connections between the housing and the process adaptor must be checked regularly by the customer/operator, and kept in full working condition.

 **DANGER!** Leaky connections can allow process medium, cleaning solution or control (compressed) air to escape to the environment, presenting a hazard for persons and the environment.

1.8.3 Malfunctions in overriding control and safety systems

 **ATTENTION!** Problems occurring in the overriding control system can trigger off uncontrolled insertion and retraction of the housing. This can in turn lead to a complete breakdown or malfunctioning of the safety devices.

1.8.4 Electricity or control (compressed) air failure

 **DANGER!**

- If there is power failure, information as to the end positions of the housing is no longer available via the inductive position indication system.
- In addition, the overriding control system receives no reliable information concerning exact positioning.
- If the control (compressed) air fails, it is possible that the insertion rod will not reach the required end position.

**DANGER!**

Before commencing any maintenance work on or removing an electrode/sensor from a housing it is essential to visually check whether the housing is in the "Service", "Measure" or any undefined intermediate position. The insertion rod must always be stationed in one of the two defined position:

- "Measure" (operating position), that is, in the fully inserted position.
- "Service" (withdrawn position), that is, in the fully retracted position.

If the insertion rod comes to rest or is stuck between the defined "Measure" or "Service" position, then no conforming measuring results can be ensured. Potential medium leaking to the flushing connection is possible. Proper isolation of the process line, depressurized etc. is recommended before carrying out the repair/maintenance if the insertion rod is in any undefined position or other than "Service" position.

**DANGER!**

The electrode/sensor may only be removed when the housing is in the "Service" position, as otherwise there is a risk that process medium could escape to the environment. This can present a potential hazard to person, environment and material. Toxic or aggressive media can pose a threat to human life through poisoning, chemical burns or scalding.

1.8.5 Medium residues

**DANGER!**

When retracting the insertion rod from the process, small quantities of process medium will remain attached to the electrode/sensor and will thus enter the flushing chamber. If this medium is a toxic or environmentally damaging substance, then such contamination must be removed and disposed of in accordance with regulations!

**DANGER!**

If the insertion rod is not completely inserted into the process, there will be a path for the process medium to enter the flushing chamber and thus to the flushing connection. This can lead to product loss or contamination.

1.8.6 Manually operated housings

**DANGER!**

The electrode or sensor may only be removed when the housing is in the "Service" position and as soon as when the manual drive train is manually turned (anti-clockwise) until hand tight. As soon as the manual drive train is completely turned anti-clockwise, the housing will automatically self-lock. After that, the manual drive train cannot be further turned either clockwise or anticlockwise.

**DANGER!**

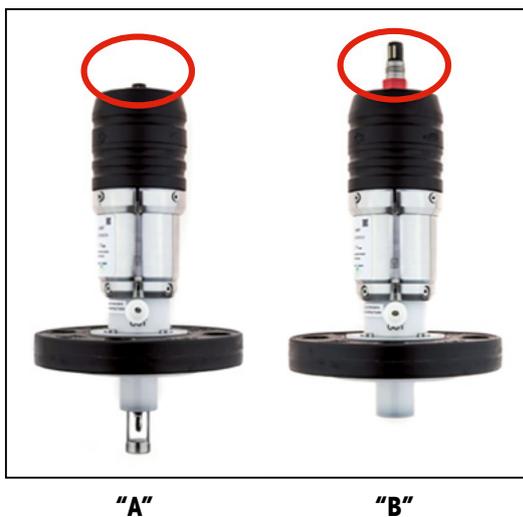
Avoid excessive force or turning the manual drive train with any special tools.

1.8.7 Pneumatically operated housing

 **ATTENTION!** In the case of the pneumatically operated InTrac 78X, failure of the compressed air supply can result in the insertion rod being pushed to the "Service" position by the process pressure. This makes continuous measurement impossible.

 **DANGER!** The electrode or sensor may only be removed when the insertion rod is fully retracted from the medium. It is essential to visually check whether the housing is in the "Service", "Measure" or any undefined intermediate position. In addition, visually check if the sensor mounting thread is fully retracted from the process (see picture) before carrying out any maintenance work. Removing the sensor from the housing when the housing is not fully retracted from the process can result in process media escaping and presents a potential hazard both to persons and to the environment.

 **DANGER!** Before the electrode/sensor is loaded into the pneumatic version InTrac 78XR or InTrac 78XI, it must be ensure that the pneumatic valves that control the position of the housing are set to the "Service" position. Incorrect setting can cause the housing to insert into the process before the loading procedure has been completed, resulting in open access to the process medium. Process medium can thereby escape and present a potential hazard both to persons and to the environment.



Note: "A": "Measure" position
"B": "Service" position

1.8.8 Heat protection

**DANGER!**

Take applicable protection measures prior to touching the holder/housing as parts of the retractable holder may have reached process temperature and cause burns.

1.8.9 External influences

**ATTENTION!**

Objects falling on the housing can damage or destroy the unit, or cause leaks etc.

**ATTENTION!**

Lateral forces may damage or destroy the unit.

1.9 Emergency measures

**ATTENTION!**

Always observe and comply with local regulations!

**ATTENTION!**

If the retractable housing has been in operation in conjunction with the automated cleaning and calibration system EasyClean, it must be ensured that before any manipulations at the housing, the EasyClean system has been completely switched off and isolated (power, compressed air and water).

1.10 Safety measures

**ATTENTION!**

Always observe and comply with local laws and regulations! These are not an integral part of this instruction manual.

**DANGER!**

It is principally necessary to wear protective equipment such as protective goggles and protective clothing.

**ATTENTION!**

The operator is responsible for the instruction of personnel. Additional copies of this instruction manual can be ordered from the equipment supplier. As an integral part of the retractable housing, this instruction manual must at all times be readily accessible to users at the point of operation of the housing.

The operator is obliged to inform the supplier/manufacturer of the retractable housing immediately about any safety-relevant incidents, or observations made, during use of the housing.

**DANGER!**

Incorrect manipulation and/or instruction errors can lead to potential hazards for persons and for the environment.

-  **ATTENTION!** Before every start-up, the retractable housing must be checked for:
- damage to the connections, fastenings, etc.
 - leakage
 - defective cables and lines etc.
 - authorization for use of the housing in conjunction with the associated plant resources.
 - In the ex-classified area installation, strictly adhere and follow the instructions as specified in Chapter 1.7 "Installation in potentially explosive areas (hazardous areas)" on page 16 and Chapter 2 "Important notes for housing uses in Ex-Classified area" on page 22.

-  **DANGER!** A defective housing must never be installed or put into operation. Poor containment, leaky connections etc. or non-compliant installation of the housings can lead to escape of process medium and thereby to a potential threat to life (incl. risk of explosion.).

1.11 Modifications

-  **ATTENTION!** No attachments or modifications to the retractable housings are allowed.

-  **DANGER!** The manufacturer/supplier accepts no responsibility for any damage caused by unauthorized attachments and alterations or for the incorporation of spare parts which are not of METTLER TOLEDO provenance. The risk is borne entirely by the operator.

2 Important notes for housing uses in Ex-Classified area

2.1 Notes on operating instructions

These operating instructions contain all the information needed for safe and proper use of the housing.

The operating instructions are intended for personnel entrusted with the operation and maintenance of sensors and housings. It is assumed that these persons are familiar with the equipment in which the sensors and housings are installed.

See Chapter 1.3 "Warning notices and symbols" on page 11 for explanation.

2.2 Intended use

The retractable housings InTrac 78X are intended solely for measurement tasks in conjunction with the specified METTLER TOLEDO electrodes/sensors, namely pH and redox (ORP) combination electrodes as well as oxygen, CO₂, conductivity or turbidity sensors. Use the housings only for this purpose.

Housings with the  or  symbol on the type plate have received approval for operation in potentially explosive/hazardous areas.

Any use of these housings which differs from or exceeds the scope of use described in this instruction manual will be regarded as inappropriate and incompatible with the intended purpose.

The manufacturer/supplier accepts no responsibility whatsoever for any damage resulting from such improper use. The risk is borne entirely by the user/ operator.

Other prerequisites for appropriate use include:

- Compliance with the instructions, notes and requirements set out in this instruction manual.
- Correct maintenance of the housings.
- Acceptance of responsibility for regular inspection, maintenance and functional testing of all associated components, also including compliance with local operational and plant safety regulations.
- Operation in compliance with prevailing regulations concerning the environmental and operating conditions as well as with the admissible mounting positions.
- Compliance with all information and warnings given in the documentation relating to the products used in conjunction with the housings.
- Correct equipment operation in conformance with the prescribed environmental and operational conditions, and admissible installation positions.
- Consultation with METTLER TOLEDO Process Analytics in the event of any uncertainties.

**DANGER!**

The housing must be operated only with the specified electrodes/sensors. The absence or the installation of an inappropriate electrode/sensor may adversely affect the resistance to pressure and temperature, the chemical resistance and the protection against explosion. Consequently, there can be leakage from the housing and/or risk of explosion that may endanger persons and the environment.

2.3 Safety instructions

**DANGER!**

- The plant operator must be fully aware of the potential risks and hazards attached to operation of the particular process or plant. The operator is responsible for correct training of the workforce, for signs and markings indicating sources of possible danger, and for the selection of appropriate, state-of-the-art instrumentation.
- It is essential that personnel involved in the commissioning, operation or maintenance of these housings or of any of the associated equipment (e.g. sensors, transmitters, etc.) be properly trained in the process itself, as well as in the use and handling of the associated equipment. This includes having read and understood this instruction manual.
- The safety of personnel as well as of the plant itself is ultimately the responsibility of the plant operator. This applies in particular in the case of plants operating in hazardous zones.
- The housings and associated components have no effect on the process itself and cannot influence it in the sense of any form of control system.
- Maintenance and service intervals and schedules depend on the application conditions, composition of the sample media, plant equipment and significance of the safety control features of the measuring system. Processes vary considerably, so that schedules, where such are specified, can only be regarded as tentative and must in any case be individually established and verified by the plant operator.
- Where specific safeguards such as locks, labels, or redundant measuring systems are necessary, these must be provided by the plant operator.
- A defective housing must neither be installed nor put into service.
- Only maintenance work described in these operating instructions may be performed on the housings.
- When changing faulty components, use only original spare parts obtainable from your METTLER TOLEDO supplier (see Chapter 8.2 “Spare parts list” on page 60).
- No modifications to the housings and the accessories are allowed. The manufacturer accepts no responsibility for damage caused by unauthorized modifications. The risk is borne entirely by the user.
- Care must be taken during installation to avoid impacts or friction that could create an ignition source.
- Tampering and replacement with non-factory components may adversely affect the safe use of the system.
- Insertion or withdrawal of removable electrical connectors or modules is to be accomplished only when the area is known to be free of flammable vapors.
- **WARNING** – INTRINSICALLY SAFE APPARATUS CAN BE A SOURCE OF IGNITION IF INTERNAL SPACINGS ARE SHORTED OR CONNECTIONS OPENED.

- **WARNING** – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.
- **WARNING** – SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
- **WARNING** – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY OF THE EQUIPMENT
- **WARNING** – FOR CONNECTION ONLY TO NON-FLAMMABLE PROCESSES.

2.4 Correct disposal of the housing

When the housing is finally removed from service, observe all local environmental regulations for proper disposal. See Chapter 9 "Decommissioning, storage, disposal" on page 61.

2.5 Use in Ex-zones



ATTENTION!

For an installation in Ex-zones please read the guide-lines following hereafter:



Ex-classification ATEX:

⊗ II 1/2G c IIC TX Ga/Gb

⊗ II 1/2D c IIIC TX Da/Db

Number of the test certificate:

SEV 13 ATEX 0161X

Ex-classification FM approved:



IS/I,II,III/1/ABCDEFG/T6 Ta = 60 °C

- 53 800 002; Entity

Project ID: 3021227

FM certificate number: FM16US0034X

FM18CA0021X

2.6 Ex-classification ATEX

2.6.1 Introduction

According to RL 94/9/EG (ATEX 95) Appendix I, InTrac 78X/*1/*2/*3/*4/*5/*6*7*8 housings are devices group II, category 1/2G and according to RL 99/92/EG (ATEX 137) may be used in zones O/1 or O/2 and gas group IIC that are potentially explosive due to combustible substances in the temperatures classes T3 to T6.

For use/installation, the requirements of EN 60079-14 must be observed.

According to RL 94/9/EG (ATEX 95) Appendix I, InTrac 78X/*1/*2/*3/*4/*5/*6*7*8 housings are devices group III, category 1/2D and according to RL 99/92/EG (ATEX 137) may also be used in zones 20/21 resp. 20/22 that contain combustible dusts.

For use/installation, the requirements of EN 50281-1-2 must be observed.

The pneumatically operated housings with electrical (inductive) position indication of the probes

may be employed in hazardous areas, Zone 1 and Zone 2 resp. Zone 21 and Zone 22, also in conjunction with separately certified, intrinsically safe, inductive proximity switches – e.g. Pepperl+Fuchs, Types NCB2*** – on condition that the applicable Gas Groups and Temperature Classes correlate with the actual inflammable materials present, and that the special conditions of the declaration are strictly adhered to.

2.6.2 Special conditions

The housings with pneumatic actuation position of the sensors with electrical feedback signal may be operated in hazardous areas Zone 1 and Zone 2 or Zone 21 and Zone 22 with separately certified intrinsically safe inductive proximity switches e.g. Pepperl + Fuchs types NCB2 ***– if the gas groups and temperature classes coincide with the used flammable substances and the special conditions of the Certificates are observed.

1. The maximum permissible ambient or process temperatures for Zone 0 (flammable gases or flammable liquids) shall be taken according to the following table:

Temperature class	Max. environment resp. media temperature
T6	68 °C
T5	80 °C
T4	108 °C
T3	130 °C

The maximum permissible ambient or process temperatures must not exceed the aforementioned values and they will be found in this instruction manual, Chapter 8 "Product specifications" on page 59.

2. The maximum permissible surface temperature for Zone 20 (combustible dust) shall be taken accordingly to the following table:

Temperature class	Max. environment resp. media temperature
T 69 °C	68 °C
T 81 °C	80 °C
T 109 °C	108 °C
T 131 °C	140 °C

The maximum permissible ambient or process temperatures must not exceed the aforementioned values and they will be found in this instruction manual, Chapter 8 "Product specifications" on page 59.

3. The metallic body of the housing type InTrac 78X*1/*2/*3/*4/*5/*6/*7/*8 has to be connected conductively to the equipotential system of the plant.
4. The housings type InTrac 78X*1/*2/*3/*4/*5/*6/*7/*8 are included in the periodic pressure testing of the system, where appropriate.
5. **WARNING** – POTENTIAL ELECTROSTATIC CHARGING HAZARD – by installation, use and maintenance work, see instruction manual.

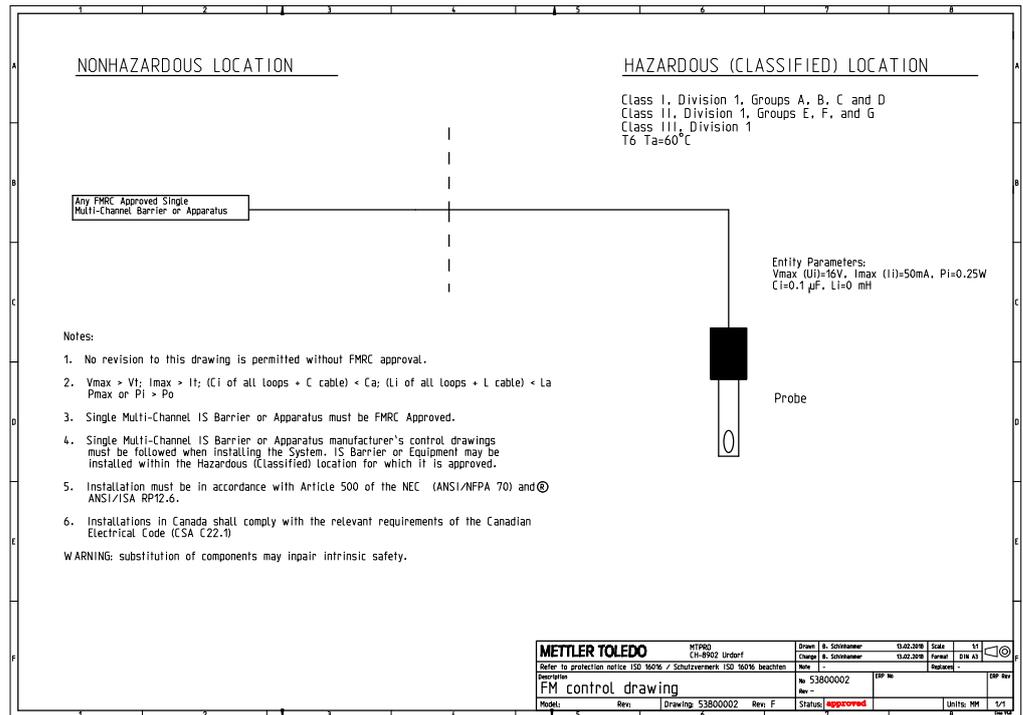
2.7 Ex-classification FM approved



IS/I,II,III/1/ABCDEFG/T6 Ta = 60 °C

2.7.1 Introduction

The following FM control drawing and the standards listed in Chapter 2.7.3 "Applied standards" on page 27 must be observed, where applicable:



2.7.2 Special conditions

See Chapter 2.6.2 "Special conditions" on page 25.

2.7.3 Applied standards

United States Standards

Title	Number	Issue Date
Approval Standard for Electrical Equipment for Use in Hazardous (Classified) Locations – General Requirements	FM Class 3600	2011
Approval Standard for Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II & III, Division 1, Hazardous (Classified) Locations	FM Class 3610	2015
Approval Standard for Electrical Equipment for Measurement, Control and Laboratory Use	FM Class 3810	2005
Explosive Atmospheres – Part 0: Equipment – General Requirements	ANSI/ISA-60079-0 (12.00.01)	2005
Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety “i”	ANSI/ISA-60079-11 (12.02.01)	2009
Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements	ANSI/ISA-61010-1 (82.02.01)	2004

Canadian Standards

Title	Number	Issue Date
Explosive Atmospheres – Part 0: Equipment – General Requirements	CAN/CSA-C22.2 No. 60079-0	2005
Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety “i”	CAN/CSA-C22.2 No. 60079-11	2009
Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements	CAN/CSA-C22.2 No. 61010-1	2004

3 Product descriptions

3.1 Scope of delivery

Standard supply of the retractable housing is made up of the following:

- One retractable housing finished assembled in accordance with description in order confirmation
- Cable grommet
- Sensor protection rod (or position visual indication rod) – **For InTrac 781X only**
- Sensor pressurized cylinder (inclu. cylinder glass), sensor pressure indicator and manual pump – **For InTrac 784X only**
- Hexagon key 2.5 mm
- 4x spare screws M4x8 (DIN912)
- 2x spacers for sensor
- instruction manual
- Quick set-up guide

3.2 Packing

The packing consists of cardboard and foam plastic.

Keep the packing for possible later use, such as for storage or transport of the housing. However, if you wish to dispose of the packing, please observe your local regulations in this respect.

 **ATTENTION!** see Chapter 9 “Decommissioning, storage, disposal” on page 61.

3.3 Checking the shipment

When unpacking the shipment, examine carefully for signs of damage. Any damage noted must be reported immediately to the carrier and your supplier. Check that the shipment accords to the delivery papers and to your order.

 **ATTENTION!** Damaged housings must not be installed or put into operation.

3.4 Product overview

The InTrac 78X retractable housings combine rugged design with great versatility to meet the demands of the harshest process condition in the chemical, petrochemical, power and utilities industries.

The retractable housing material is specially designed for a range of harsh applications. Wetted parts are available in different materials offering installation flexibility in many applications.

The retractable housing meets major international requirements including installation in Ex-classified areas (ATEX and FM Approvals), where it can be safely installed.

The retractable housings are normally attached to tanks or piping with an applicable process connection (i.e. InFlow). In order to meet the various process requirements, the retractable housings are available in different versions, depending on:

- which **type of electrode/sensor is to be employed**
- **InTrac 781** is for pH/redox electrodes, O₂ and conductivity sensor (with diameter 12 mm and PG13.5 thread). Depending on the product configuration, the InTrac 781 can be operated with sensor insertion length 225 mm (insertion depth approx. 80 mm) or 425 mm (insertion depth approx. 280 mm).
- **InTrac 784** is for pH/redox electrodes with liquid electrolyte e.g., InPro 2000 or 465 sensor series. Depending on the product configuration, the InTrac 784 can be operated with sensor insertion length 250 mm (insertion depth approx. 80 mm) or 450 mm (insertion depth approx. 280 mm).
- **Operating modes:**
 - M = manually operated version
 - R = pneumatically check back version
 - I = pneumatically operated version with inductive check back indicators
- **Depends on types of process connection, insertion depth (“H”) is approx.**
 - 80 mm
 - 280 mm

Exact dimension illustrations of all housings are to be found in the relative Appendix to this Manual.

- **Medium-wetted materials**

Metal varieties:

 - Stainless steel DIN 1.4404/AISI 316 L
 - DIN 2.4602/AISI Alloy C22 (e.g. Hastelloy)

Polymer varieties:

 - Polypropylene (PP)
 - Full polyvinylidene fluoride (PVDF) version
 - Polyvinylidene Fluoride with combination of AISI Alloy C22 for sensor tip protective cage (PVDH)
 - Polyether ether ketone (PEEK)
- **Medium-wetted sealing materials (O-rings)**
 - FPM (Viton®)
 - EPDM
 - FFKM (Kalrez®)
- **Process connections**
 - Ingold DN25
 - Flange attachments (DIN, ANSI)
 - NPT external thread
- **Flushing connections**
 - G ¼" or ⅛" thread female
 - ¼" NPT female
 - Without (blind plugs are included)

The exact version of the housing can be seen from the Smart Configuration Key (SCK) on the housing.

Example: **InTrac781M/4404/VI/225/D04/G14**

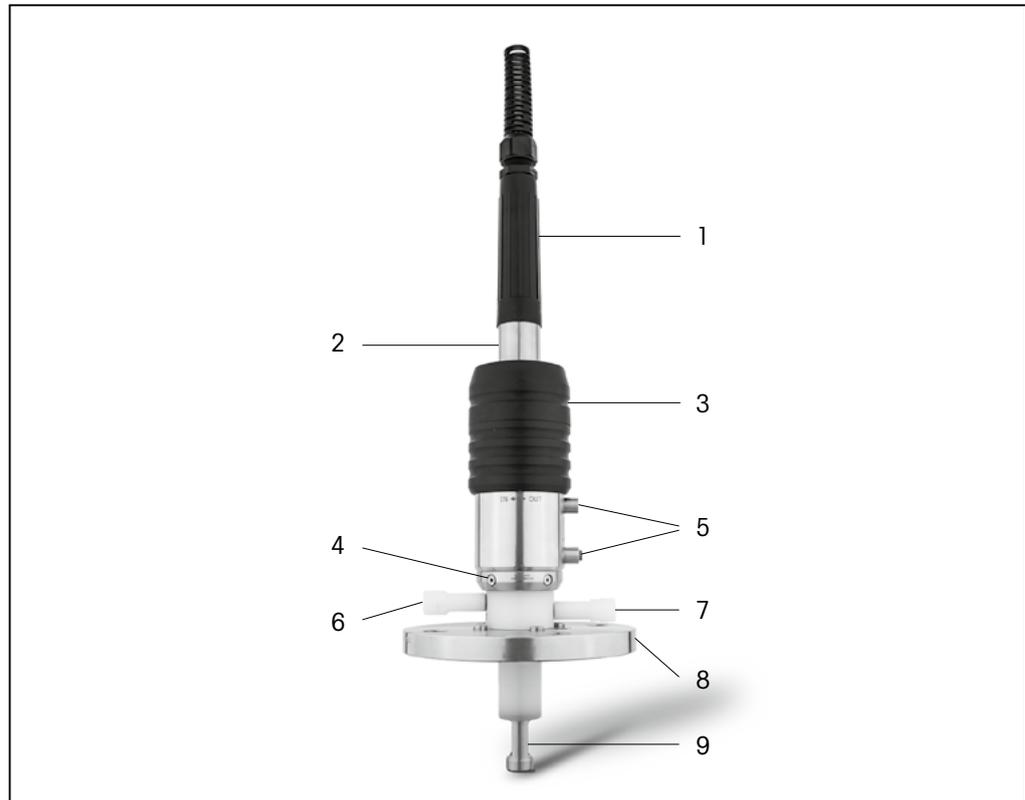
The product structure InTrac 78X can be found in Chapter 10.3 “Product structure (InTrac 78X)” on page 66.

3.5 Construction of the retractable housings

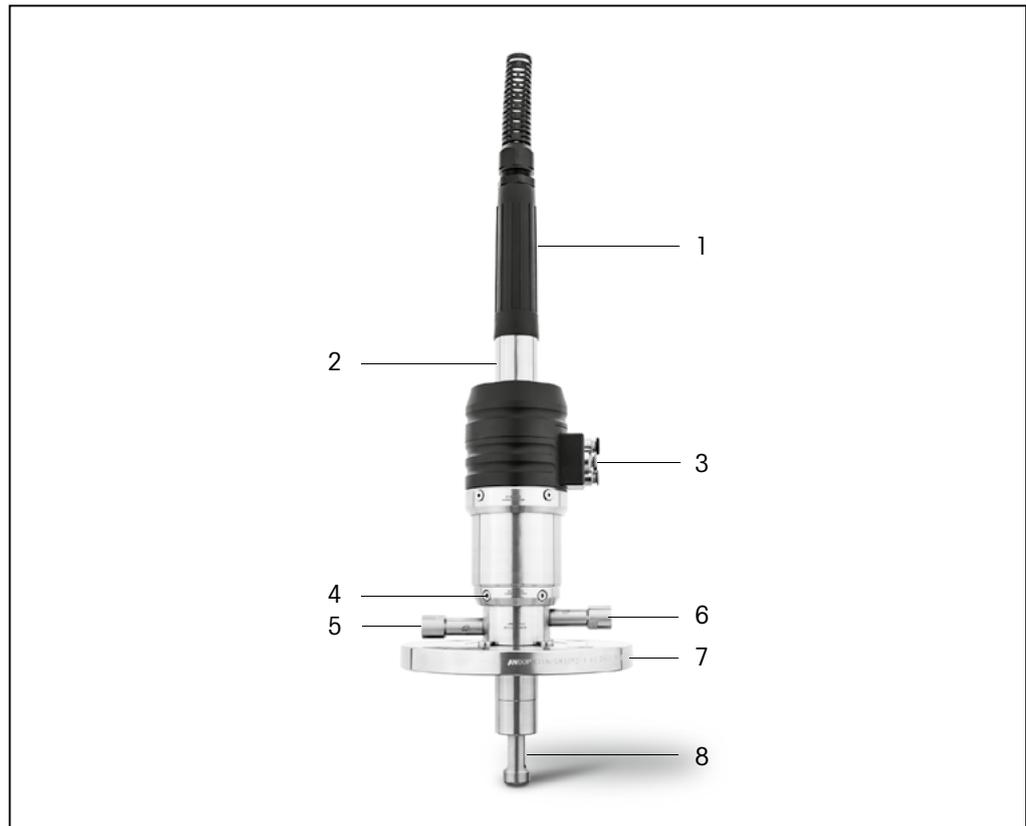
3.5.1 Operating modes of the retractable housings

Each version of the retractable housing family InTrac 78X is available in three different types (**M, R and I**):

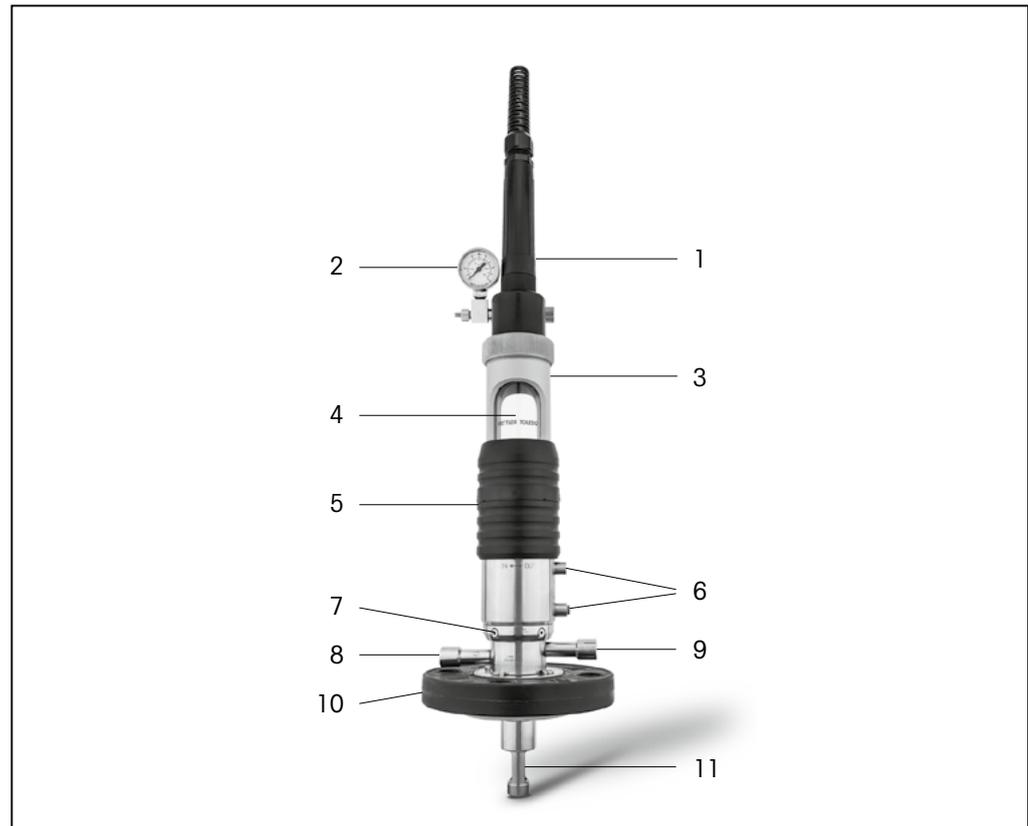
InTrac 781M



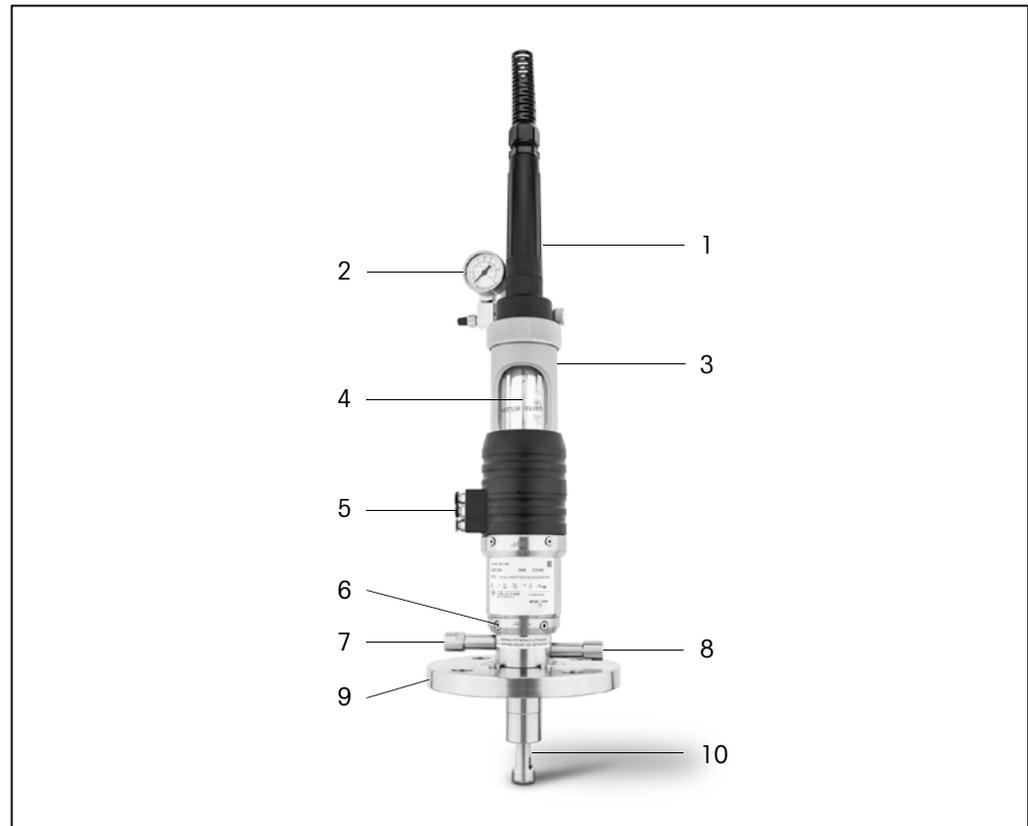
Pos	Description
1	Cable grommet
2	Sensor position rod (with sensor status- "Service"/"Measure" position indications)
3	Manual drive train
4	Housing clamp screw
5	Sensor interlocking bolts
6	Flushing connection "Out"
7	Flushing connection "In"
8	Process flange connection
9	Insertion rod with sensor protection cage

InTrac 781 (type "R" or "I")

Pos	Description
1	Cable grommet
2	Sensor position rod (with sensor status- "Service" / "Measure" position indications)
3	Pneumatic (type R) drive train or, pneumatic drive train with inductive check back indicator (type I)
4	Housing clamp screw
5	Flushing connection "In"
6	Flushing connection "Out"
7	Process flange connection
8	Insertion rod with sensor protection cage

InTrac 784M

Pos	Description
1	Cable grommet
2	Sensor pressure indicator
3	Sensor pressurized cylinder (with sensor status- "Service" / "Measure" position indications)
4	Glass cylinder
5	Manual drive train
6	Sensor interlocking bolts
7	Housing clamp screw
8	Flushing connection "In"
9	Flushing connection "Out"
10	Process flange connection
11	Insertion rod with sensor protection cage

InTrac 784 (type "R" or "I")

Pos	Description
1	Cable grommet
2	Sensor pressure indicator
3	Sensor pressurized cylinder (with sensor status- "Service" / "Measure" position indications)
4	Glass cylinder
5	Pneumatic (type R) drive train or, pneumatic drive train with inductive check back indicator (type I)
6	Housing clamp screw
7	Flushing connection "Out"
8	Flushing connection "In"
9	Process flange connection
10	Insertion rod with sensor protection cage

3.6 Description of function of retractable housings

With the retractable housings InTrac 78X, electrodes/sensors can be cleaned or replaced without interrupting the ongoing process. In addition, with the aid of auxiliary equipment (EasyClean system) it is possible to calibrate and/or backwash (when sensor retracted) and/or flush with the electrode/sensor installed.

3.6.1 Manually operated versions (InTrac 78XM)

The manual version of InTrac 78X equipped with the manual drive train. The manual drive train is a mechanical rotary drive that converts a rotating motion into forwards/backwards movement of the insertion rod. The sensor can be retracted from the process liquid to the cleaning chamber (for maintenance) or likewise. State of the art drive train design allows operators to drive the sensor against high process pressure without the needs to isolate the complete process line. Thanks to manual drive train, the disturbance to the process is minimal.

To retract the sensor from the process, the "Measure" sensor interlocking bolt is pressed. Manually rotate the manual drive train anticlockwise until the "Service" sensor interlocking bolt pops out. In this position it is safe to perform sensor maintenance. The reverse process is applied for inserting the sensor back for operation.

On top of the sensor interlocking bolts, the level marking is visible on Sensor Position Rod (for InTrac 781M) or Sensor Pressurized Cylinder (for InTrac 784M) to provide additional information about the sensor status (either it is in "Measure" or "Service" position). It is necessary to ensure the sensor position rod/sensor pressurized cylinder has fully reached the "Service" level marking before carrying out any sensor maintenance.



ATTENTION! The sensor pressure indicator (InTrac 784X) indicates the sensor's internal pressure (i.e. InPro 2000 sensor). To ensure the sensor electrolyte continues to flow freely from the sensor junction during operation, sensor internal pressure must be higher than the process pressure. Please refer to sensor instruction manual for detail.

3.6.2 Pneumatically operated versions (InTrac 78X, type R or I)

The compressed air connections are used to pressurize the piston of the insertion rod either from above or from below. This allows the insertion rod and hence the electrode/sensor to be moved either downwards (into the "Measure" position) or upwards (into the "Service" position). The piston remains pressurized with compressed air at the respective end position.

In housing versions equipped with a position indication system, a pneumatic (InTrac 78XR) or pneumatic with inductive (InTrac 78XI) signal is triggered when the insertion rod is in the respective end position ("Measure" or "Service"). This signal is transmitted to a remote indicator (not included with housing).

On top of the sensor position signal, the level marking both "Measure" and "Service" are visible on the Sensor Position Rod and Sensor Pressurized Cylinder to provide additional sensor status information. It is necessary to ensure that the sensor position rod/sensor pressurized cylinder has fully reached the "Service" level marking before carrying out any sensor maintenance.

Depending on the remote programmable logic controller (PLC) and the operating system (e.g., EasyClean), the InTrac 78X (type R or I) is programmable for sensor backwash cleaning and while the sensor is retracted from the process, for cleaning, or calibration with buffer (pH sensor).



ATTENTION! The housings are equipped with an intelligent sensor locking system: if no electrode/sensor has been fitted in the housing, it is not possible to retract/send back the insertion rod into the process.



CAUTION! The insertion and retraction speed of the insertion rod can be set as desired by means of the adjustment screw on the throttle valve and by adjustment of the air supply pressure. Please note that for proper operation the compressed air supply must be at a higher pressure than the process pressure.

-  **ATTENTION!** The compressed air must be free of oil, dust and water. The recommended compressed air pressure is between **4 to 6 bar**.
-  **CAUTION!** For backwash cleaning, the cleaning liquid (from the flushing connection "IN") must supply higher pressure than the process pressure. Insufficient cleaning liquid pressure may result in process media entering the flushing connections.
-  **ATTENTION!** The cleaning liquid pressure must not exceed **6 bar**. Install a pressure reducer if necessary.
-  **ATTENTION!** The sensor pressure indicator (InTrac 784X) indicates the sensor internal pressure. To ensure the sensor electrolyte continues to flow freely from the sensor junction during operation, sensor internal pressure must be higher than the process pressure. Please refer to sensor instruction manual for details.
-  **DANGER!** Process medium can present a hazard to human life and to the environment.

4 Installation and start-up

4.1 Preparation of the equipment

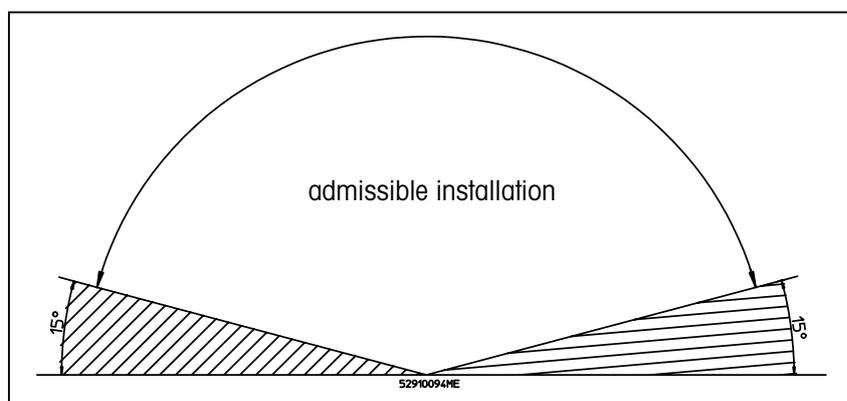
The retractable housings are mounted and fixed on a vessel (reactor, tank, pipe, etc.) either with flange connection, or via a NPT thread. Various DIN or AISI nominated process connections are available.

 **ATTENTION!** Attachment/gasket between the flange connection and/or threaded seal PTFE tape for the NPT connection (if applicable) is the responsibility of the customer.

In order to ensure optimum performance of the retractable housings at all time, please pay attention to the following installation instructions:

- The retractable housing can be mounted vertically or in an inclined position.

 **CAUTION!** In the case of inclined mounting, the angle of the housing must be equal to or greater than 15° above the horizontal.



- The retractable housing is to be mounted in such a position that there is always enough clearance available for its correct functioning (correct "Measure" position in the sample medium) as well as for maintenance work (checks, fitting and removal of the electrodes/sensors). The relative dimensions can be seen on the drawings in the relative appendix to this instruction manual, or in the specifications. It is recommended to have clearance of at least 0.5 to 1 m for maintenance work purposes.
- Mounting of the retractable housing in exposed positions should be avoided. If this is not possible, relative measures to protect against damage or interference must be taken.
- Outdoor installation of the retractable housing is possible. However, avoid direct sunlight, rain, water and/or excessive heat. The working ambient temperature is $-10 \dots 70^{\circ}\text{C}$.

 **ATTENTION!** For outdoor installation of the InTrac 78XM housing, the sensor interlocking bolts should be installed facing a position where water splashes (when happen) shall not ingress into the drive train via the sensor interlocking bolts.

4.2 Fitting and installation work

**CAUTION!**

In all installation work described below, ensure that the equipment in which the housing is to be installed is in a non-hazardous condition (depressurized, empty, rinsed, vented, etc.).

**CAUTION!**

For Ex-environment installation: Potential electrostatic charging hazard to the housing flange and wetted parts. Proper discharge is needed before carrying out the housing installation or after service, and/or removing from the process. See Chapter "1.7 Installation in potentially explosive areas (hazardous areas)" on page 16 and Chapter 2 "Important notes for housing uses in Ex-Classified area" on page 22.

4.2.1 Fitting the housing

Choose the installation point carefully to ensure the sensor is always filled with process medium even when sample flow is interrupted. Any air bubble in the medium may perturb the measurement. Consider installing proper air venting upstream of the housing.

**CAUTION!**

The sensor protective cage (in "Measure" position) must have a clearance of at least 3–5 cm from the vessel/pipe/tank etc., and wall in the installation. Refer respective housing insertion depth dimension for detail.

4.2.1.1 Fitting via a flange

1. Clean the sealing surfaces of the flange (housing and flange connection on vessel) and check for damage.

**CAUTION!**

If the process media/reaction products are considered to be dangerous, it is imperative that an embedded seal is used at the flange interface and/or a splash guard mounted. Fitting of the retractable housing with damaged flange connections is not allowed and can present a hazard to persons and/or lead to material damage.

2. Use the appropriate flange gasket which is suitable for the process condition. Replace if necessary.

**ATTENTION!****In the case of housings made of special materials:**

Check that the seal is present on the flange of the retractable housing and is not damaged. Replace if necessary. Ensure correct quality and positioning of the seal.

3. Check the vessel to ensure that there are no obstacles in the insertion direction which could hinder the motion of the insertion rod.
4. Position the housing on the flange connection, align, and tighten evenly crosswise using the prescribed number of bolts and nuts.

4.2.1.2 Fitting via NPT external thread

1. Ensure the threads are free of particles or dirt.
2. Wind PTFE tape (or appropriate sealing tape which is suitable for the process condition) around the external male thread.
3. Screw the housing carefully into the female socket.
4. Check the Installation for leaks.

4.2.1.3 Fitting via a weld-in socket (with Ingold DN 25)

1. Clean the centering spigot of the retractable housing and the bore of the weld-in socket, checking for damage



CAUTION! Fitting of the retractable housing with a damaged spigot or into a damaged weld-in socket is not allowed and can present a hazard to persons and/or lead to material damage.

2. Check the vessel/tank/piping etc. to ensure that there are no obstacles in the insertion direction which could hinder the motion of the immersion tube.
3. Check the O-ring on the spigot for damage and replace it if necessary. Lightly smear the O-ring with grease. Ensure correct quality and positioning of the O-ring.
4. Position the housing on the weld-in socket and carefully insert the spigot into the bore.
5. Finally, tighten the ring nut until the connection is completely sealed.



CAUTION! Checking of the sealing/tightness of the process adaptor is the responsibility of the operator, who must also guarantee same by adopting appropriate measures. Additional safety provisions are necessary if the connection is subject to stress from vibrations.

4.2.2 Adjusting the sensor protective cage

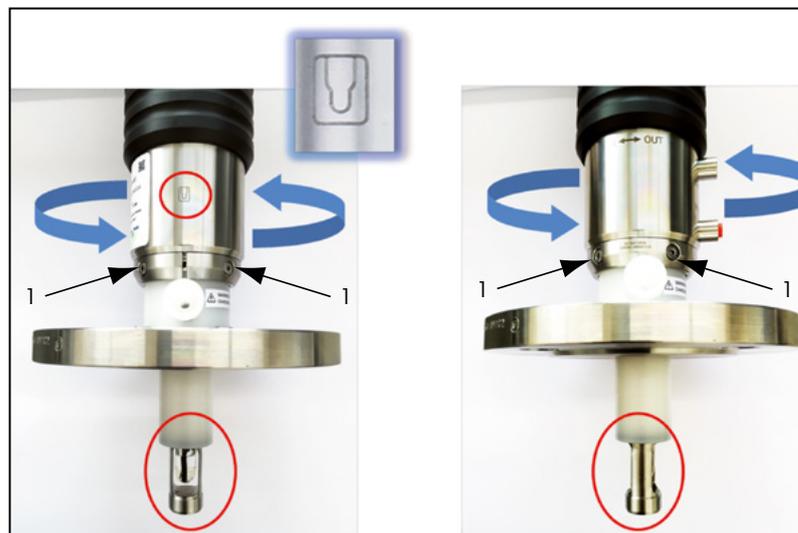
A sensor protective cage is fitted to the lower end of the insertion rod. For visual inspection, a symbol is visible on the housing body and parallel to the sensor protective cage opening (see picture).

For maximum sensor tip protection against any particles in the medium, the sensor protective cage can be adjusted in respect of the medium flow.

1. Make sure the housing is fully retracted (or in "Service" position)
2. Loosen the housing clamp screws "1".
3. Turn the cylinder drive train clockwise/anticlockwise until the preferable sensor protective cage position has been reached.
4. Tighten the housing clamp screws "1".



DANGER! Before loosen the housing clamp screws, the pipe/vessel/tank etc must be isolated (depressurize, empty, rinse, purge and vent, etc.).



4.2.3 Attaching the flushing lines

The InTrac 781/784 is equipped with "In" and "Out" flushing connections. The flushing connection labelled "In" is the inlet for the sensor cleaning liquid (i.e. clean water). The flushing connection labelled "Out" is the outlet for the cleaning medium drain out from housing during the sensor cleaning process.

To achieve the optimum sensor cleaning, the cleaning liquid inlet pressure is recommended to be at least **1 bar**. The cleaning liquid pressure must not exceed **6 bar**. Install a pressure reducer if necessary.

During the insertion or retraction motion, if the insertion rod comes to rest in other than the defined end positions "Measure" and "Service", process media can escape to the environment via the flushing chamber and the flushing lines. This could create a hazard for personnel, equipment and the environment.

When constructing the flushing water installation, use only materials which are resistant to corrosion and chemicals. The cleaning medium must be considered beforehand. Ensure the cleaning medium will not react with the process medium or harm the housing wetted material.

Recommendations for proper operation and safe use

If cleaning of the sensor is not desired, the flushing connections (both "In" and "Out") must be sealed by pegs, or pipe plugs as leakage of process liquid through the open flushing connections is possible. If flushing lines must be equipped with check valves which may only be opened when the insertion rod is in the retracted position ("Service"). After maintenance work on the sensors, the valves must be closed.

Installing pipe plugs/pegs to flushing connection

When ordering InTrac781/784 housings, flushing connections '[G14] – G $\frac{1}{4}$ " thread female' or '[N14] – $\frac{1}{4}$ " NPT female' [1] are delivered together with the housing. In cases where cleaning of the sensor is not desired, the pipe plugs/pegs (sourcing locally) can be directly installed to the flushing connections [1]. Alternatively, the flushing connections [1] can be removed by turning them anti-clockwise, and the pipe plugs/pegs G $\frac{1}{8}$ " can be directly installed to [2].

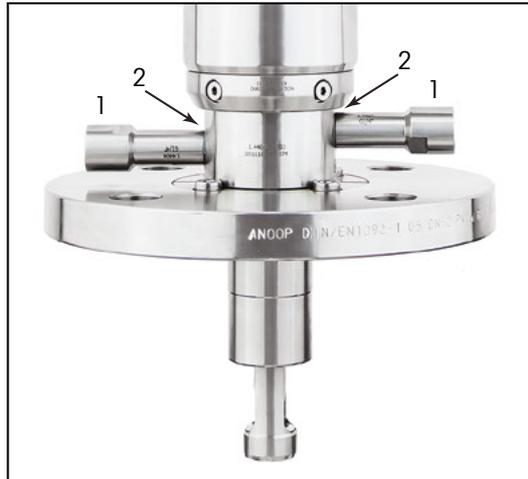
In cases where a flushing connection '[G18] – G $\frac{1}{8}$ " thread female' is ordered, flushing connections [1] are **not included** in housing delivery. Flushing connections can be directly installed to [2]. If cleaning of the sensor is not desired, the pipe plugs/pegs G $\frac{1}{8}$ " can be directly installed to [2].

METTLER TOLEDO offer G $\frac{1}{8}$ " pipe plugs in different material. See spare part list for detail.

In cases where flushing connection '[00_] – Without (blind plugs included)' is ordered. Two blind plugs G $\frac{1}{8}$ " are directly installed to [2] in the housing delivery.



ATTENTION! Avoid excessive force apply when installing pipe plugs/pegs to the housing. Excessive forces can irreversibly damage the housing thread.



Flushing lines and valves installation:

1. Install appropriate valves i.e. ball valve (and/or check valve if applicable) upstream of the flushing connection "In" and downstream of flushing connection "Out". Note: The valves are not in the scope of delivery.
2. Connect the cleaning line to the flushing connection "In".
3. Connect the drain line to the flushing connection "Out".
4. Check tightness of the piping, valves connections.
5. When motorized valves are preferred, connect the cable to the operation system accordingly. Do the operating system set-up (if applicable).



DANGER!

When retracting the insertion rod from the process, small quantities of process medium will remain attached to the electrode/sensor and will thus enter the discharge line during flushing procedures. If the process medium contains toxic, caustic substances damaging to the environment, then it is imperative to consult local regulations relative to the design and construction of effluent (treatment) installations.

4.2.3.1 Normal sensor cleaning

When the flushing lines are properly installed, the sensor can be retracted from the process and remains in the housing while it is cleaned with cleaning liquid. It is not necessary to dismantle the sensor and clean it manually in the lab.

1. Retract the sensor from the process until the housing is in the "Service" position.
2. Open both valves located upstream and downstream of the flushing connections "In" / "Out".
3. Let the cleaning liquid clean the sensor for 2 minutes (or longer if appropriate).
4. Close both valves.
5. Insert the sensor into the process.



ATTENTION!

The cleaning liquid pressure must not exceed 6 bar. Install a pressure reducer if necessary.

4.2.3.2 Backwash sensor cleaning

For special application where particles and dirt are present in the process medium, backwash cleaning is recommended. As soon as the housing start to retract from the process, backwash cleaning flushes out the dirt/particles which stick on the sensor tip/sensor protective cage. This allows the majority of the dirt to be flushed out into the process.

1. A valve upstream of the flushing connection "In" is open but the valve downstream of the flushing connection "Out" remains closed.
2. Retract the sensor from the process.
3. When the sensor is fully retracted (or in "Service" position), open the valve downstream of the flushing connection "Out".
4. Let the cleaning liquid clean the sensor for 2 minutes (or longer when appropriate).
5. Close both valves.
6. Insert the sensor into the process.



CAUTION!

For backwash cleaning, the cleaning liquid (from the flushing connection "IN") must supply higher pressure than the process pressure. Insufficient cleaning liquid pressure may result in process media entering the flushing connections.



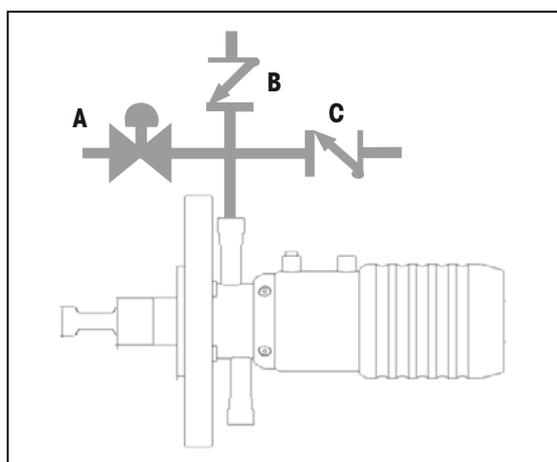
ATTENTION!

The cleaning liquid pressure must not exceed 6 bar. Install a pressure reducer if necessary.

4.2.4 Installation for calibration of the measurement system with electrode/sensor installed

If the measurement system has to be cleaned and/or calibrated with the electrode/sensor installed, a distributor with three connections is attached to the flushing connection "In".

Make three connections as shown in the following schematic diagram:



- Connection "A" to the cleaning line inlet via a control valve.
- Connections "B" and "C" to the corresponding buffer solution supply, each via a non return valve.



Note! When the housing is operated with EasyClean EC400, it is recommended to order the InTrac housing with G 1/4" thread female flushing connection.

4.2.5 Pneumatic-connections (For InTrac 78X, type R)

The InTrac 78XR is operated with compressed air. The compressed air is used to drive the drive train of the housing, so the sensor can retract or insert into the process. The extension of the cylinder of the drive train is fitted with four compressed air connections. For proper connection, the items below are required.

- Two pneumatic tubes with outer diameter 4 mm
- Two pneumatic tubes with outer diameter 6 mm

The four compressed air connections are labelled numerically as below.

- **"1"**: Air supply for "Service" position; pneumatic tube with outer diameter 6 mm
- **"2"**: Air supply for "Measure" position; pneumatic tube with outer diameter 6 mm
- **"3"**: "Service" position reply signal; pneumatic tube with outer diameter 4 mm
- **"4"**: "Measure" position reply signal; pneumatic tube with outer diameter 4 mm



- ATTENTION!**
- The pressure in the control air supply to the housing must reach 4 bars.
 - The compressed air must be free of oil, dust and water. The recommended compressed air pressure is between 4 to 6 bar.
 - When no reply signal is required, the compressed air connections **"3"** and **"4"** must be properly sealed.

- CAUTION!**
- The insertion and retraction speed of the insertion rod can be set as desired by means of the adjustment screw on the throttle valve and by adjustment of the air supply pressure. Please note that for proper operation the compressed air supply must be at a higher pressure than the process pressure.

4.2.6 Pneumatic connection (For InTrac 78X, type I)

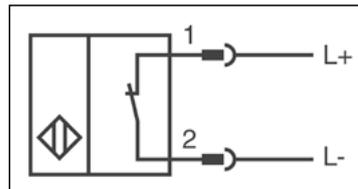
The InTrac 78XI is operated with compressed air. There are two compressed air connections, and two inductive check back sensor connections. The inductive check back sensor is installed to the housing prior to shipment. The connections are labelled numerically as below:

- **"1"**: Air supply for "Service" position; pneumatic tube with outer diameter 6 mm
- **"2"**: Air supply for "Measure" position; pneumatic tube with outer diameter 6 mm
- **"3"**: "Service" position inductive check back sensor
- **"4"**: "Measure" position inductive check back sensor

The compressed air is connected to connection **"1"** and **"2"** respectively via pneumatic tubes.

Two cable sockets (M12, 4-pin, NAMUR) are required to connect the inductive check back sensor to the process control. The inductive check back sensor's specification are as below:

Description	Data
Switching element function	NAMUR, NC
Nominal voltage, U_0	8.2 V (R_i approx. 1 k Ohm)
Switching frequency, f	0...2000 Hz
Current consumption	Measuring plate not detected ≥ 3 mA Measuring plate detected ≤ 1 mA
Connection type	Device connector M12 x 1, 4-pin

Connection:

Wire colors in accordance with EN60947-5-6

- Terminal 1 = Brown
- Terminal 2 = Blue

For EasyClean 200 e only:

For installation in ex-classified area, additional sensor output interface terminals (2 pcs.) are required to connect the inductive check-back from sensor (from InTrac 78XI housing) to the EasyClean 200 e system. The EasyClean 200 e system and the sensor output interface terminals must be installed outside the ex-classified area. The sensor output interface terminals (not in scope of delivery) can be purchased from Pepperl + Fuchs®; model number KCD2-E2L.

Please consult your local representative for more detail.

**ATTENTION!**

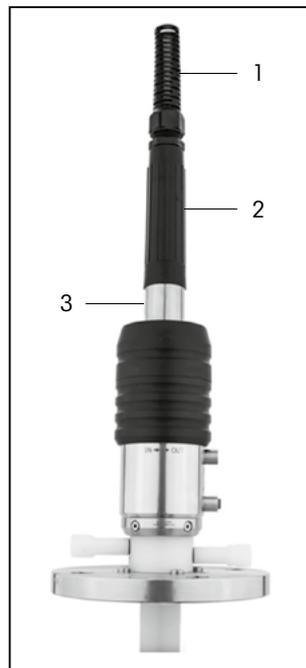
- The pressure in the control air supply to the housing must reach 4 bars.
- The compressed air must be free of oil, dust and water. The recommended compressed air pressure is between 4 to 6 bar.

**CAUTION!**

The insertion and retraction speed of the insertion rod can be set as desired by means of the adjustment screw on the throttle valve and by adjustment of the air supply pressure. Please note that for proper operation the compressed air supply must be at a higher pressure than the process pressure.

4.2.7 Fitting the electrode/sensor

Retractable housings InTrac 781



1. Set the housing to the "Service" position. Visually check if the housing is in "Service" position (level mark from sensor position rod; "3"). For InTrac 781M, it is possible to check if the sensor locking bolt is in the "Service" position.
2. Unscrew the cable antikink "1".
3. Unscrew the cable grommet "2".
4. Unscrew the sensor position rod "3".
5. Check that the correct type of electrode/sensor has been selected (see Chapter 10.1 "Electrode/sensor selection" on page 62). For optimum sensor insertion length, the sensor washer must be of the range 5 to 7 mm. Sensors with a shorter washer must use the sensor spacer (included in the delivery).
6. Check the electrode/sensor for damage (e.g. breakage of electrode).



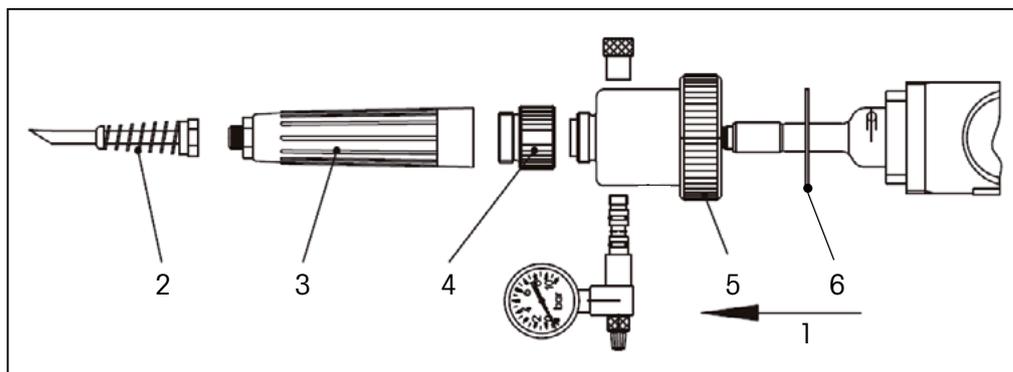
CAUTION! A damaged electrode/sensor must never be installed.

7. Check washers and O-rings on electrodes/sensors and replace if necessary.
8. Remove watering cap from the tip of the electrode/sensor and rinse electrode/sensor with water.
9. Carefully insert electrode/sensor into the immersion rod and screw in by hand as far as it will go.



DANGER! Under no circumstances whatsoever may tools be used.

10. Remove the cover cap of the electrode/sensor screw cap connection.
11. Run the sensor cable (open end) through the sensor position rod "3", cable grommet "2", and antikink protection "1". Connect the plug to the electrode/sensor.
12. Mount sensor position rod "3", follow by cable grommet "2" and tighten by hand. Finally, also hand-tighten the cable antikink protection "1".
13. Connect the sensor open end to the transmitter.

Retractable housing InTrac 784

CAUTION! Tightening of the ring nut "5" and the plastic adapter "4" (see diagram above) in the wrong order, can lead to breakage of the pH/redox electrode. It is therefore essential to follow the procedure described below:

1. Set the housing to the "Service" position.
2. Unscrew the cable antikink protection "2".
3. Unscrew the cable grommet "3", the plastic adapter "4", and finally "5".
4. Check that the correct type of pH/redox electrode has been selected (see Chapter 10.1 "Electrode/sensor selection" on page 62).
5. Check the electrode for damage.

CAUTION! A damaged electrode must never be installed.

6. Remove the watering cap from the tip of the electrode, the stopper from the filling port, and the rubber band. Then rinse the electrode with water.

DANGER! After removing the stopper, do not tilt the electrode, as reference electrolyte may spill out through the open filling port.

7. Check the level of the reference electrolyte in the electrode and top up if necessary (see instruction sheet of the relative electrode).
8. Carefully insert the electrode into the insertion rod until it comes up against the PTFE saddle.

ATTENTION! If installing in an inclined position, ensure that the marking "Position electrode this side up" points upwards. In this position no reference electrolyte can flow out through the filling port (assuming that the fill level is correct).

9. Check gasket "6" at upper part of housing for damage and replace if necessary. Mount upper part of housing and tighten ring nut "5" by hand.

 **CAUTION!** Ring nut "5" of upper part may be tightened **only with plastic adapter "4" removed.**

10. Check condition of seal of plastic adapter "4" and replace if necessary. Mount plastic adapter "4" and tighten by hand.
11. Remove the cover cap of the plug connection of the electrode.
12. Run the sensor cable (open end) through the cable grommet "3" and antikink protection "2". Connect the plug to the electrode.
13. Mount cable grommet "3" and tighten by hand. Finally, also hand-tighten the cable antikink protection "2".
14. Connect the sensor open end to the transmitter.
15. Set the compensation pressure in the housing. The compensation pressure can be set with a bicycle pump via the valve assembly at the pressure gauge, or established by attaching a permanent (dry, oil-free and filtered) compressed air supply (using the pressure connection set included in the standard equipment supply).

 **ATTENTION!** To ensure electrolyte flow from the reference electrode to the sample medium the air pressure in the upper part of the housing must be at least 0.5 bars and maximum 2 bars above that of the sample medium (take the hydrostatic pressure of the sample medium into account).

 **ATTENTION!** If there is no (positive) pressure differential to the sample medium, no reliable measurements can be taken.

4.3 Startup procedures for housings

4.3.1 Startup of manually operated housings

Before startup, all fitting and installation work (see Chapter 4.2 "Fitting and installation work" on page 37) must have been completed!

Each time before startup, check the measuring system. Inspect the electrode/sensor assembly and examine for leaks from housing and apparatus (see also Chapter 7 "Troubleshooting" on page 57). Do not commence operation until the measuring system has been checked and any necessary corrective action taken.

Before startup of a housing in hazardous area, it is to be clarified beyond doubt that it is permitted to use the housing in question in conjunction with the other associated plant resources. Read and fully understand Chapter 1.7 "Installation in potentially explosive areas (hazardous areas)" on page 16 and Chapter 2 "Important notes for housing uses in Ex-Classified area" on page 22 before carrying out the start-up.

Proceed as follows for startup:

1. For InTrac 78XM start-up, press the "Service" interlock bolt continuously and turn the manual drive train clockwise carefully.
2. The "Measure" interlock bolt pops up when the housing is fully inserted into the process.

 **ATTENTION!** Only turn the manual drive train by hand. No excessive force should be applied when turning the manual drive train.

4.3.2 Startup of pneumatically operated housings

Before startup, all fitting and installation work (see Chapter 4.2 "Fitting and installation work" on page 37) must have been completed!

Each time before startup, check the measuring system, inspect the electrode/sensor assembly and examine for leaks from housing and apparatus (see also Chapter 7 "Troubleshooting" on page 57). Do not commence operation until the measuring system has been checked and any necessary corrective action taken.

Before startup of a housing in a hazardous area, it must be established beyond doubt that it is permitted to use the housing in question in conjunction with the other associated plant resources. Read and fully understand Chapter 1.7 "Installation in potentially explosive areas (hazardous areas)" on page 16 and Chapter 2 "Important notes for housing uses in Ex-Classified area" on page 22 before carrying out the start-up.

Proceed as follows for startup:

1. Open the air supply for the control system. Check:
 - the insertion and retraction motion of the insertion rod, as well as the status of the indicators for the respective end positions.
 - the control air system for tightness. Immediately seal any leaking connections.
2. Drive the insertion rod into the "Service" position and open flushing water supply (at least 1 bar). Check flushing water system for tightness. Immediately seal any leaking connections.
3. If the system is equipped for calibration of the measuring system, move the housing into the "Service" position and perform a calibration (see Chapter 5.4 "Calibrating the measuring system" on page 52). Check:
 - for correct calibration procedure.
 - the buffer solution systems for tightness. Immediately seal any leaking connections.

On successful completion of all function checks, the equipment in which the housing is installed can be started up.



CAUTION!

Following startup of the equipment, particular care must be taken in any manipulations at the retractable housing. Therefore it is essential to pay close attention to the information in Chapter 5.1 "Important information for everyday operation" on page 51.

4.4 Shutdown procedure for manually and pneumatically operated housings

1. Move housing to the "Service" position.
2. Open flushing water supply, flush electrode/sensor and close flushing water supply again.
3. Isolate the pipe/tank/vessel etc, from the housing (depressurize, empty, rinse, purge and vent, etc.).
4. Close control air feed to the housing (except InTrac 78XM).

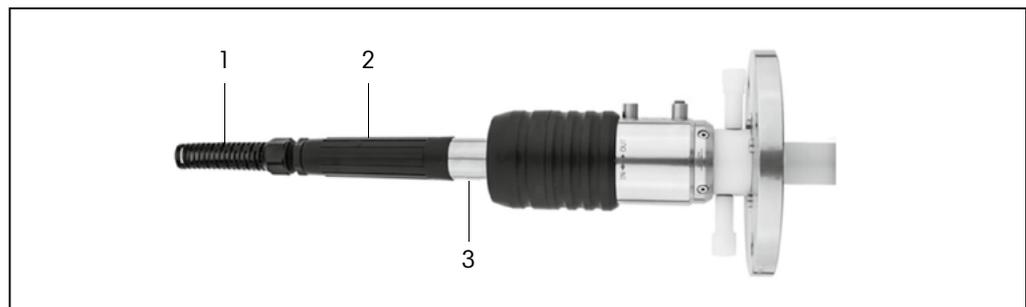
4.5 Dismantling work

4.5.1 Removing the electrode/sensor



CAUTION! Removal and installation of the electrodes/sensors may only be performed in the "Service" position of the housing.

InTrac 781 retractable housings



1. Set the housing to the "Service" position.



ATTENTION! Visually check the sensor position rod "3" and ensure the housing is fully retracted (at "Service level" mark).

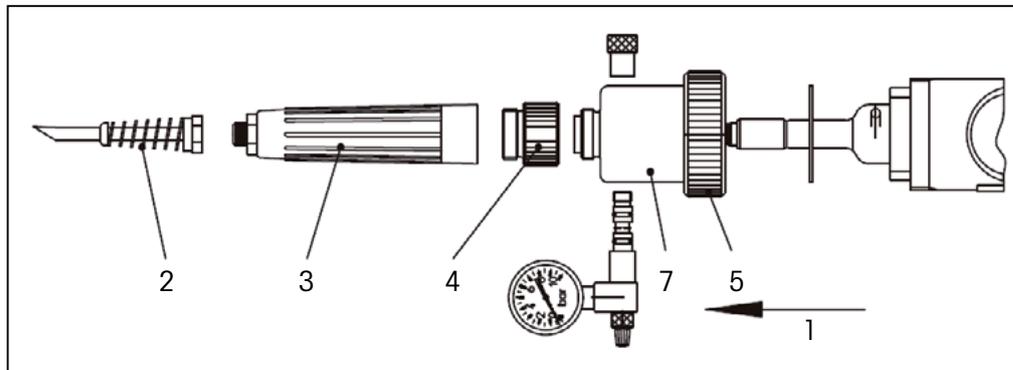
2. Open flushing water supply, flush electrode/sensor and close flushing water supply again.
3. Unscrew cable antikink "1".
4. Unscrew cable grommet "2".
5. Unscrew sensor position rod "3".
6. Disconnect the sensor cable from the electrode/sensor.
7. Unscrew electrode/sensor and carefully remove from insertion rod.

InTrac 784 retractable housing



CAUTION!

If the plastic adapter "4" and the ring nut "5" are loosened in the wrong order, this can lead to breakage of the pH/redox electrode. It is therefore essential to follow the procedure described below.



1. Set the housing into the "Service" position.
2. Open flushing water supply, flush electrode/sensor and close flushing water supply again.
3. Depressurize the upper part of the housing by slightly loosening the valve assembly at the pressure gauge or by interrupting the compressed air supply. Retighten the valve assembly.
4. Remove cable antikink "2" and cable grommet "3".
5. Disconnect the sensor cable from the electrode.
6. Remove plastic adapter "4".
7. Undo ring nut "5" and remove upper part "6".
8. Carefully withdraw the electrode from the insertion rod.



ATTENTION!

Specific information on the electrode (calibration/alignment with the measuring system, storage, etc.) is to be found in the relative documentation for the electrode or measuring system.

4.5.2 Removing the retractable housing

1. Shut down the housing (see Chapter 4.4 "Shutdown procedure for manually and pneumatically operated housings" on page 47).
2. Remove the electrode/sensor (see Chapter 4.5.1 "Removing the electrode/sensor" on page 48).
3. Dismantle flushing water and control air lines.



CAUTION!

Close the connection in order to prevent ingress of dirt.

4. Undo ring nut or flange connection and carefully remove housing.



CAUTION!

Never place or support the housing on the front ends of the insertion rod (risk of damage).

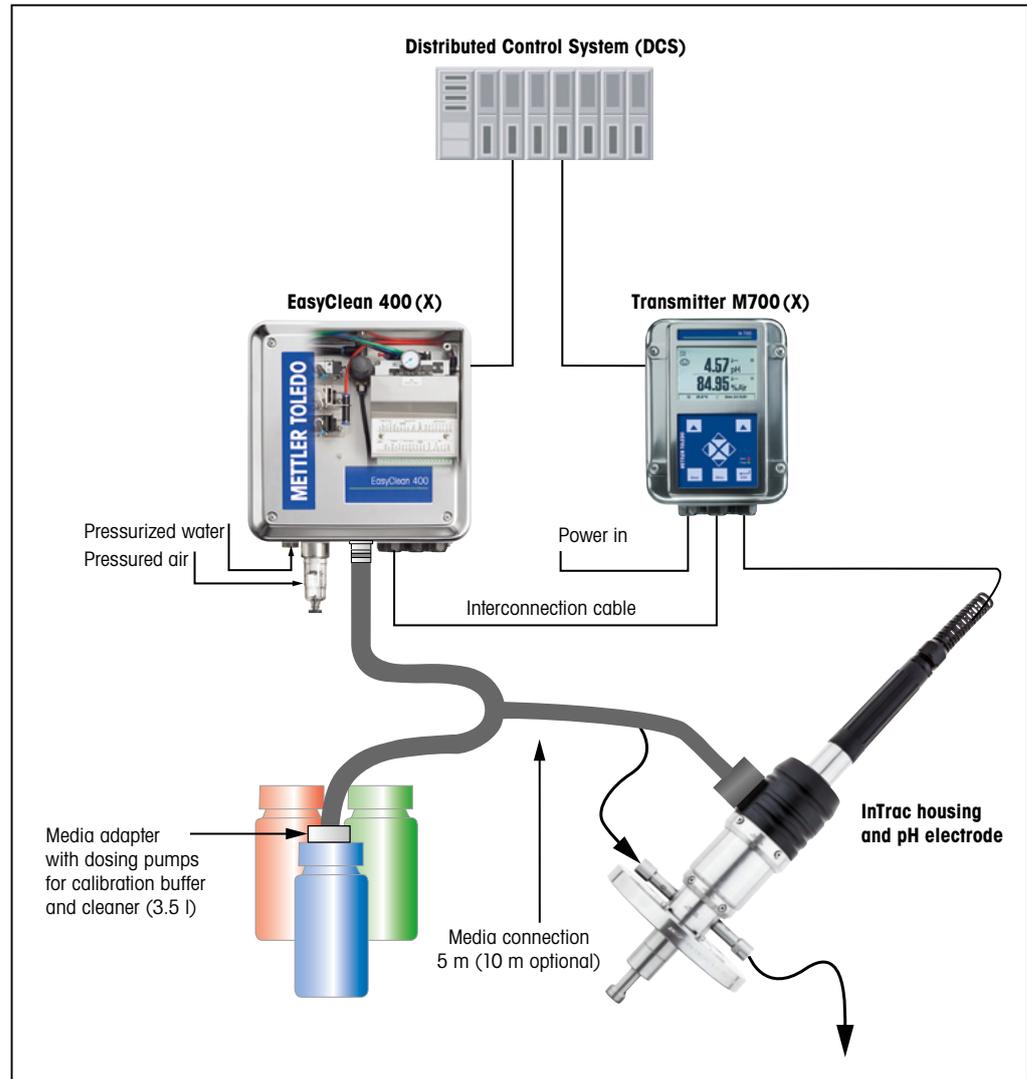
4.6 Use of retractable housings in conjunction with EasyClean

The retractable housing can be employed in conjunction with METTLER TOLEDO's cleaning and calibration system, EasyClean. This enables full automation of the measuring system. Current regulations together with the connection instructions given in the relative Instruction Manual, as well as directives governing pneumatic and water connections are to be fully observed at all times.



CAUTION!

In the case of installations intended for operation in hazardous areas, only EasyClean 400X systems may be used in conjunction with a InTrac 78X housing.



5 Operation

5.1 Important information for everyday operation



CAUTION! No attempt may be made to move the insertion rod into the "Measure" position without an electrode/sensor properly installed!

During operation,

- **never** loosen the lines of the pneumatic system or of the flushing and buffer solutions.
- **never** remove fastening components (screw/bolts of flange, ring nut, etc.).

If any malfunctions occur during operation, the equipment in which the housing is installed must first be made safe before any corrective measures are taken.

For all work on the equipment during everyday operation, wear the stipulated protective clothing (protective goggles, gloves, breathing apparatus, etc).

5.2 Inspection work in everyday operation

The following inspection work should be performed in everyday operation:

- Check all systems such as air, flushing water and buffer solutions for leaks. Refill buffer solutions if necessary.
- Visually check fastenings (ring nut, flange, NPT-thread) of the housing at the vessel for firm seating and leaks.
- Check the condition of the electrode/sensor. A faulty or damaged electrode/sensor must be replaced immediately.
- Check the inspection window for leaking (picture).



Additional check to the housing with pressure compensation (InTrac 784):

- Check functioning of pressure gauge.
- Check air pressure in upper part (pressure gauge). The air pressure must be at least 0.5 bars and maximum 2 bars above that of the sample medium (take hydrostatic pressure of the sample medium into account) to ensure the flow of electrolyte from the reference electrode to the sample medium.



ATTENTION! The desired overpressure is set with a bicycle pump via the valve assembly at the pressure gauge or established by means of a compressed air supply.

- Check level of the reference electrolyte. The level of the reference electrolyte steadily sinks due to outflow through the diaphragm. If the liquid level has sunk to a level below the mouth of the bulb (reservoir) of the pH/redox electrode, then the reference electrolyte must be topped up (see Chapter 6 "Maintenance" on page 53).

5.3 Cleaning the electrode/sensor

The electrode/sensor must be cleaned before removal, before calibration of the measurement system or at regular intervals during operation (depending on the process medium). Proceed as follows:

1. Move the housing into the "Service" position.
2. Open both valves located upstream and downstream of the flushing connections "In"/"Out".
3. Let the cleaning liquid clean the sensor for 2 minutes (or longer if appropriate).
4. Close flushing water supply (or both valves).

5.4 Calibrating the measuring system

The frequency of calibration of the measurement system depends on the electrode/sensor type and the sample medium. To calibrate the measurement system, proceed as follows:

1. Retract the insertion rod into the "Service" position.
2. Open flushing water supply, flush electrode/sensor and then close flushing water supply again (see Chapter 5.3 "Cleaning the electrode/sensor" on page 52).
3. Remove electrode/sensor (procedure, see Chapter 4.5.1 "Removing the electrode/sensor" on page 48).



ATTENTION! This is only necessary if your installation does not allow calibration of the measurement system with the electrode/sensor installed.

4. Perform calibration in accordance with the operating instructions for the respective electrode/sensor and transmitter.
5. Re-install electrode/sensor (procedure, see Chapter 4.2.7 "Fitting the electrode/sensor" on page 44).



ATTENTION! This is only necessary if your installation does not allow calibration of the measurement system with the electrode/sensor installed.

6. Open flushing water supply, flush the electrode/sensor and then close flushing water supply again.
7. Set the insertion rod into the "Measure" position.

6 Maintenance

6.1 Important information on maintenance

**Establish a service plan adapted to your process.
Consult your local METTLER TOLEDO representative for details.**

 **DANGER!** The information and instructions given in Chapter 1 "Introduction" on page 9 and Chapter 2 "Important notes for housing uses in Ex-Classified area" on page 22 must be fully adhered to.

 **CAUTION!** Maintenance and service work on the housings may only be carried out by appropriately trained personnel. Only the maintenance and repair work described in the following Sections may be performed on the retractable housings.

 **CAUTION!** It is possible that the process medium could harm the environment and your health (toxic, caustic, corrosive, etc.). Therefore, ensure that the equipment is in a non-hazardous condition before you start with any maintenance work.

 **DANGER!** Before startup, the housing must be checked to ensure that:

- the right types of O-ring have been selected and that they are undamaged and correctly positioned (flushing chamber, insertion rod).

 **ATTENTION!** Only original spare parts from METTLER TOLEDO may be used, otherwise all guarantees become automatically invalid.

6.2 Topping up reference electrolyte (InTrac 784)

The work described below applies only for pH/redox electrodes with liquid reference electrolyte. In order to top up the reference electrolyte, proceed as follows:

1. Remove electrode (see Chapter 4.5.1 "Removing the electrode/sensor" on page 48).

 **ATTENTION!** The reference electrolyte may not be topped up with the electrode installed.

2. Top up reference electrolyte (Electrolyte No. see marking "Refill" on the electrode).

 **CAUTION!** Take care not to exceed the maximum filling level.

3. Re-install the electrode (see Chapter 4.2.7 "Fitting the electrode/sensor" on page 44).

**Do not allow any spillage of reference electrolyte to remain in the housing.
Wash out and dry the housing.**

6.3 Replacing seals in contact with the process medium (InTrac 78X)

Depending on the application, it is a must to replace the seal at least every year. With **aggressive media**, the seals may need to be changed at correspondingly **shorter intervals**. The seal condition may visually inspect via the housing inspection windows. The seals must be replaced when there is leaking visible on the inspection windows. Frequent insertion and retraction motion of the insertion rod can also have an influence on the necessary maintenance intervals.

 **ATTENTION!** Recommendations by METTLER TOLEDO concerning maintenance intervals are based solely on experience gained in standard applications and in no way binding or an admission of any guarantee liability whatsoever on the part of the manufacturer/supplier. Depending upon the degree of aggressiveness of the process medium, the necessary maintenance intervals to support smooth operation of the equipment may be correspondingly shorter.

To replace the seals, proceed as follows:

1. Set the housing to the "Service" position.

 **ATTENTION!** Visually check the sensor position rod and ensure the housing is fully retracted (at "Service level" mark).

2. Perform shutdown procedure as described in Chapter 4.4 "Shutdown procedure for manually and pneumatically operated housings" on page 47
3. Removing the sensor/electrode as described in Chapter 4.5.1 "Removing the electrode/sensor" on page 48
4. Remove the retractable housing as described in Chapter 4.5.2 "Removing the retractable housing" on page 49

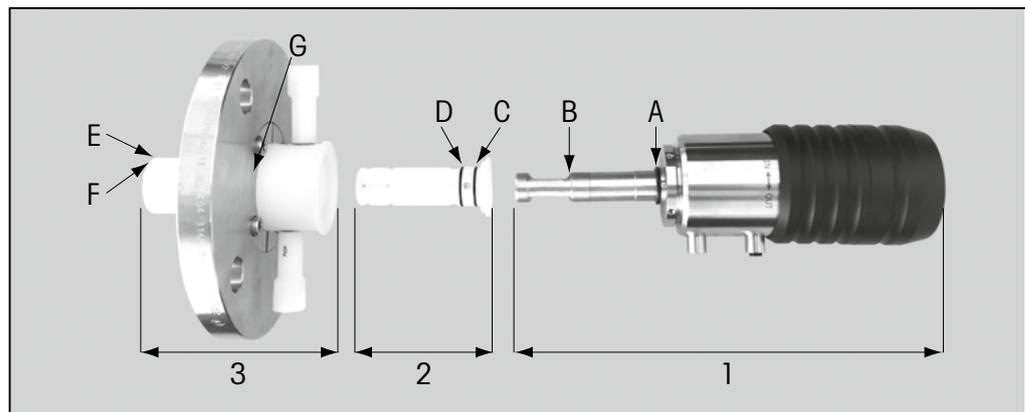
 **CAUTION!** Never place or support the housing on the front ends of the insertion rod (risk of damage).

5. Loosen the four housing clamp screws.

 **ATTENTION!** Usually the housing clams remain on the housing drive train and should be ejected by gently pushing it with the small slot screw drive (flat-end).

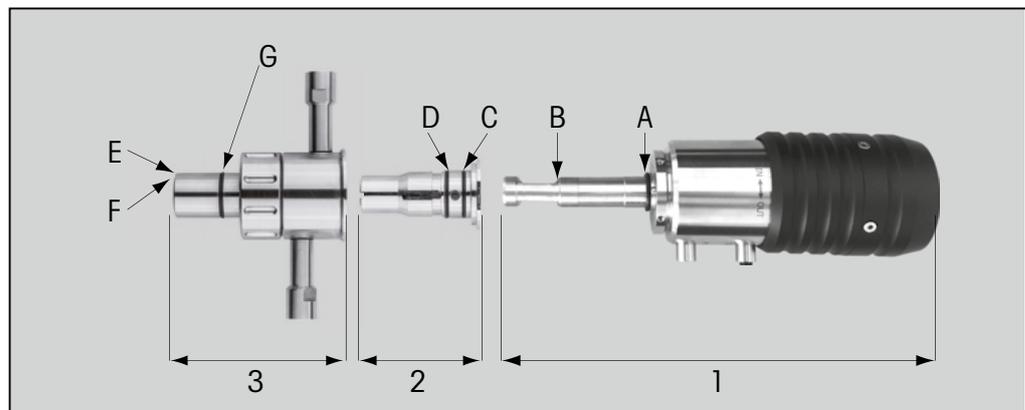
6. Remove the drive train "1" and cleaning chamber "2" from the process flange connection "3" as shown.
7. There are a total of seven seals have to be replaced (arrows A to G in picture). Replace all seven seals with new ones.

6.3.1 Flange



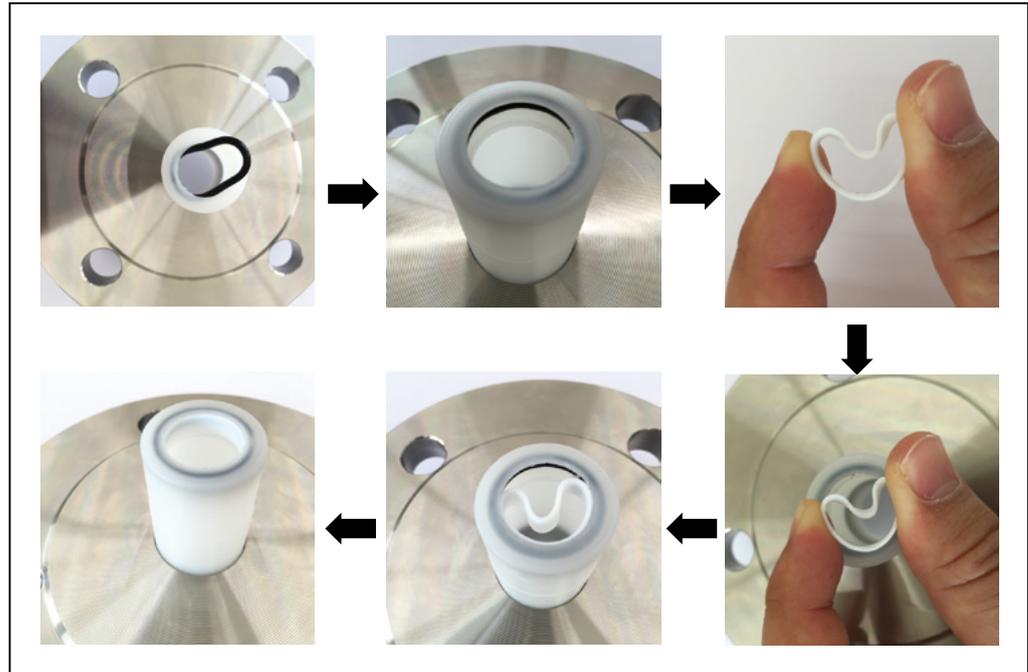
- Seal "A": diameter 18.72 × 2.62 mm
- Seal "B": diameter 10.77 × 2.62 mm
- Seal "C" and "D": diameter 21.95 × 1.78 mm
- Seal "E": scraper (diameter 19 × 6 × 1 mm)
- Seal "F": diameter 21.89 × 2.62 mm
- Seal "G": diameter 29.82 × 2.62 mm

6.3.2 Ingold DN 25



- Seal "A": diameter 18.72 × 2.62 mm
- Seal "B": diameter 10.77 × 2.62 mm
- Seal "C" and "D": diameter 21.95 × 1.78 mm
- Seal "E": scraper (diameter 18 × 6 × 1 mm)
- Seal "F": diameter 18.77 × 1.78 mm
- Seal "G": diameter 21.95 × 1.78 mm

 **ATTENTION!** Attention! When installing seals "E", and "F" follow these instruction. If the seals are installed in the wrong order, it can lead to leaking of media into the housing.



8. Carefully install seal "F" to the housing
9. Slightly bend the seal/scrapper "E" as pictured.
10. Gently insert the seal "E" into the cleaning chamber.

 **ATTENTION!** Never bend the seal/scrapper "E" with excessive force. By doing this, the seal will be irreversibly damaged.

11. Install the drive train "1" and cleaning chamber "2" to the process flange connection "3". Mount the housing clamps and fasten tightly with the four screws.

 **ATTENTION!** Usually the housing clamps need to be gently pushed, so they can fit between the drive train "1" and the flange connection "3". The clamps should never block the inspection windows.

12. Install the housing to the process line/vessel/tank etc as described in Chapter 4.2 "Fitting and installation work" on page 37
13. Fitting the electrode/sensor as described in Chapter 4.2.7 "Fitting the electrode/sensor" on page 44.
14. Follow start up procedure as described in Chapter 4.3 "Startup procedures for housings" on page 46.

 **ATTENTION!** Details of replacements and examination of the seals are to be documented in the maintenance log.

 **CAUTION!** Only perform the dismantling work described and instructed in this Chapter and replace only the seals listed above. Check that the correct types of seals have been selected, examine for any signs of damage and for correct seating.

7 Troubleshooting

In this chapter you will find an overview of possible malfunctions which could appear during operation of the retractable housings, their cause, as well as a guide to appropriate remedial measures.



DANGER!

It is essential to comply with the safety instructions given in Chapter 1 "Introduction" on page 9 and Chapter 2 "Important notes for housing uses in Ex-Classified area" on page 22.

Malfunction	Cause	Remedial action
Insertion rod cannot be inserted.	There is no electrode/sensor installed in the housing .	Install an electrode/sensor.
	Loose sensor.	Tighten sensor.
	InTrac 78X type R and I: Wrong pneumatic tube connection.	Check pneumatic connection, Chapter 4.2.5 "Pneumatic-connections (For InTrac 78X, type R)" on page 42.
	InTrac 78X type R and I: compressed air pressure too low.	Pressure must between 4 and 6 bar. The compressed air pressure must higher than the process pressure. Check.
Insertion rod remains stuck between the end positions "Service" and "Measure".	The sensor position rod/sensor pressurized cylinder is not fully fastened.	Fasten the sensor position rod/sensor pressurized cylinder.
	InTrac 78X type R and I: No or insufficient control air pressure .	Check control air system/adjust pressure.
	InTrac 78X type R and I: Leak in control air system.	Check/make leakproof control air system.
	Deposits of sample medium lead to seizing of insertion rod.	Remove housing and clean (see Chapter 6 "Maintenance" on page 53).
	Drive unit defective.	Contact your local METTLER TOLEDO representative.
Sample medium discharges via flushing lines during normal operation.	The housing is stuck in between "Service" and "Measure" positions.	Follow troubleshooting as above, "Insertion rod remains stuck between the end positions "Service" and "Measure".
	Seals of flushing chamber are defective.	Remove housing and replace seals (see Chapter 6 "Maintenance" on page 53).
Sensor breaks frequently.	Process liquid contains solids.	Adjust the sensor protective cage (see Chapter 4.2.2 "Adjusting the sensor protective cage" on page 38).
	Sensor is not correctly installed.	See Chapter 4.2.7 "Fitting the electrode/sensor" on page 44.
Sample medium escapes from the inspection windows.	Seals need to be replaced.	Replacing seals (see Chapter 6.3 "Replacing seals in contact with the process medium (InTrac 78X)" on page 54).
Sample medium escapes at the flange connection/fastenings.	Flange connection unevenly positioned or not fastened tightly enough.	Check positioning of flange connection and/or tighten the fastenings
	Flange gasket defective.	Check gasket and replace if necessary
Sample medium escapes through the NPT thread.	Thread insufficiently sealed.	Seal using PTFE tape/appropriate sealing tape
InTrac 784: No pressure in upper part (pressure compensation) or drops rapidly.	Compensation pressure not (correctly) set.	Set compensation pressure with pump or check compressed air supply
	Leak in upper part.	Check screw fittings and seals
	Broken electrode.	Replace electrode

Malfunction	Cause	Remedial action
Incorrect measurement values/fluctuations in measurement data.	Defective electrode/sensor or transmitter.	Check electrode/sensor and transmitter. Replace or repair as necessary.
	Improper installation point.	Ensure the sensor tip always in contact with medium. Air bubble may perturb the measurement. See Chapter 4.2.1 "Fitting the housing" on page 37.
InTrac 78XI end position is not indicated.	Power failure/loosen cable connection.	Check power supply/check cable connection.
	Defect in inductive indicator. Air supply failure in pneumatic indicator.	Contact your local METTLER TOLEDO representative.
InTrac 78X type R and I: Compressed air emitted at inspection windows.	Drive train defective.	Contact your local METTLER TOLEDO representative.

**DANGER!**

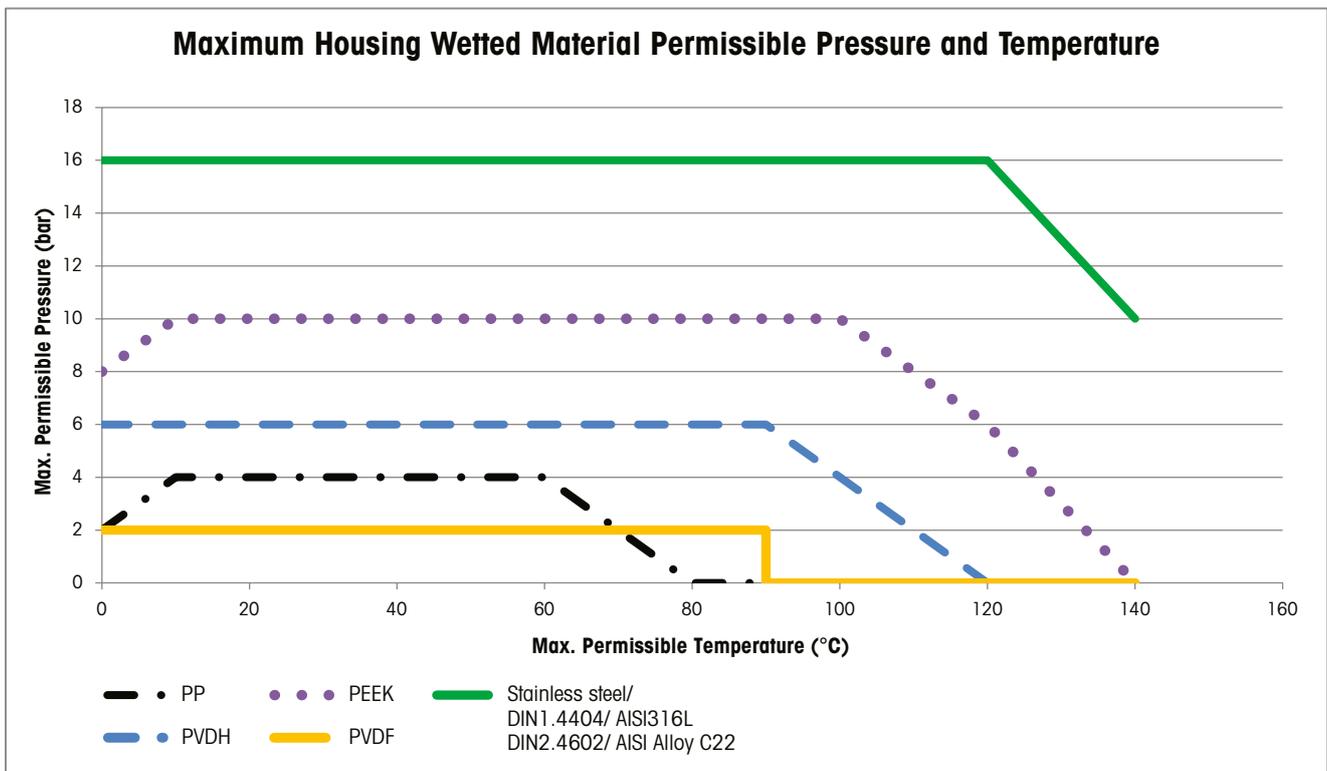
Breakage of the cleaning chamber can lead to mixing of process medium and cleaning medium.

8 Product specifications

8.1 Technical data

Ambient conditions

Temperature	SS316L, alloy C-22: -10 to 70 °C; PP, PVDF, PEEK, PVDH: 0 to 70 °C
Operating mode	manual or pneumatic or with inductive check back
Weight	InTrac 781 (80mm insertion length) approx. 4.0 kg InTrac 784 (80mm insertion length) approx. 4.5 kg
Dimension	See dimension drawing (Chapter 10.2)
Material	Refer to Chapter 10.3 "Product structure (InTrac 78X)" on page 66.
Cleaning liquid	Max. 6 bar
Control air for pneumatic operation (InTrac 78X, type R and I)	Free of oil, dust and water. 4–6 bar
Process particle size	Less than 1 mm diameter
Process condition	See diagram "Maximum Process Permissible Pressure and Temperature."



8.2 Spare parts list

Spare parts

For InTrac 78X which in operate with sensor length 220/225/250 mm (with flange or NPT connection)	
Designation	Order no.
Set of seals FPM (Viton®)	30 283 337
Set of seals FFKM (Kalrez®)	30 283 338
Set of seals EPDM	30 283 339

For InTrac 78X which in operate with sensor length 220/225/250 mm (with Ingold DN 25 connection)	
Designation	Order no.
Set of seals FPM (Viton®)	30 335 858
Set of seals FFKM (Kalrez®)	30 360 071
Set of seals EPDM	30 360 072

For InTrac 78X which in operate with sensor length 420/425/450 mm (with flange or NPT connection)	
Designation	Order no.
Set of seals FPM (Viton®)	30 283 340
Set of seals FFKM (Kalrez®)	30 283 341
Set of seals EPDM	30 283 342

Blind plugs for flushing connections	
Designation	Order no.
Blind plugs 2 × G $\frac{1}{8}$ " (1.4301)	30 327 316
Blind plugs 2 × G $\frac{1}{8}$ " (2.4602)	30 327 317
Blind plugs 2 × G $\frac{1}{8}$ " (PVDF)	30 327 318
Blind plugs 2 × G $\frac{1}{8}$ " (PP)	30 327 319
Blind plugs 2 × G $\frac{1}{8}$ " (PEEK)	30 327 390

Replacement of all other parts of the housings may only be carried out by appropriately trained personnel. Please contact your local METTLER TOLEDO representative.

9 Decommissioning, storage, disposal



PLEASE REFER TO Chapter 1.6 "Manipulation of and maintenance work on the housings" on page 13!

Decommissioning may only be carried out by persons with appropriate training or by skilled technicians.

9.1 Decommissioning

Proceed as described in Chapter 4.5.2 "Removing the retractable housing" on page 49.

9.2 Storage

Store the InTrac 78X in a dry place. Before storage, the housing must properly cleaned and dry.

9.3 Disposal

Waste electrical products should not be disposed of with household waste.



It is recommended that the operator disposes of the device in accordance with local regulations. The operator must deliver the device either to a licensed private or public disposal company, or dispose of it himself in accordance with prevailing regulations. Waste is to be recycled or disposed of without causing any risk to human health, and without using procedures or methods that might harm the environment. Check with your Local Authority or retailer for recycling advice.

Sorting

Sorting into waste groups takes place when dismantling the device. The groups are listed in the current European Waste Catalogue. This catalog is valid for all wastes, whether intended for disposal or for recycling.

The packaging is made up of the following materials:

- cardboard
- foam plastic

Depends on the housing configuration, in general the housing may be made of the following or a combination of the following materials:

- Stainless steel (DIN 1.4404/AISI 316 L, and/or DIN 2.4602/AISI Alloy C22).
- Polypropylene (PP)
- Polyvinylidene fluoride (PVDF)
- Polyether ether ketone (PEEK)
- For housing InTrac 78X[!] (Inductive check back) only:
Contain electrical or electronic in the inductive check back sensor.

10 Appendices

10.1 Electrode/sensor selection

This is a brief overview of pH and redox electrodes suitable for use with specific media. For further information on the extensive range of electrodes and sensors available from METTLER TOLEDO, please contact your local METTLER TOLEDO representative

Suitable Electrodes/Sensors	Sensor length (mm)	mm	mm
pH/ORP	InPro 2000	250	450
	InPro 2000 i		
	InPro 3100	225	425
	InPro 3100 i (SG)		
	InPro 3250 (SG)		
	InPro 3250 i/SG		
	InPro 3251		
	InPro 3252		
	InPro 3253 (SG)		
	InPro 3253i/SG		
	InPro 3300		
	InPro 4260		
	InPro 4260 SG		
	InPro 4262		
	InPro 4260 i/SG		
	InPro 4800-1-2-i/SG		
	InPro 4800 (SG)	-	
	InPro 4802 (SG)		
	InPro 4881 i/SG		425
		InPro 4281 i/SG	
	DXK pH-Redox-Reference EI.425		
DPA	HA-405-DPA-SC-S8		
	Pt 4805-DPA-SC-S8		
DPAS	405-DPAS-SC-K8S		
	Pt 4805-DPAS-SC-K8S Pt		
DO/GPO	InPro 6860 i	220	420
	InPro 6980 i		
	InPro 6800/6850 i		
	InPro 6950 (i)/InPro 6900 (i)		
	InPro 6000 G Series		
CO ₂	InPro 5000 (i)	220	-
Conductivity	InPro 7001-VP	225	-
	InPro 7100 (i)	-	425

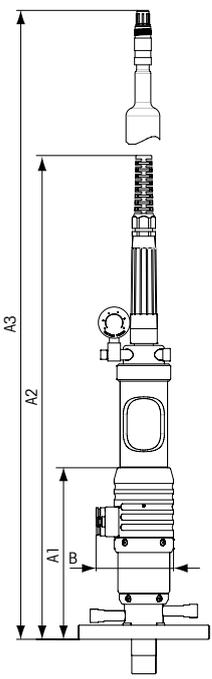
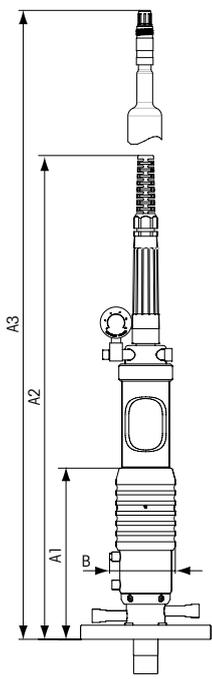
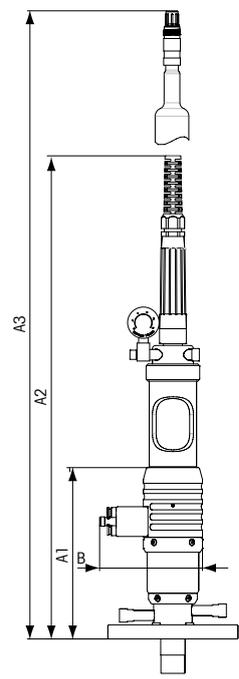
10.2 Dimensional drawing

InTrac 781

InTrac 781 (operation mode R, M and I)						
	InTrac 781R		InTrac 781M		InTrac 781I	
Sensor length [mm]	225	450	225	450	225	450
A1 [mm]	208	208	208	208	208	208
A2 [mm]	518	518	518	518	518	518
Recommended space clearance for sensor maintenance; A3 [mm]	590	790	590	790	590	790
B [mm]	98	98	79	79	131	131

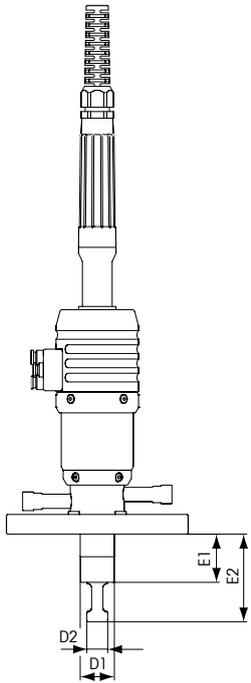
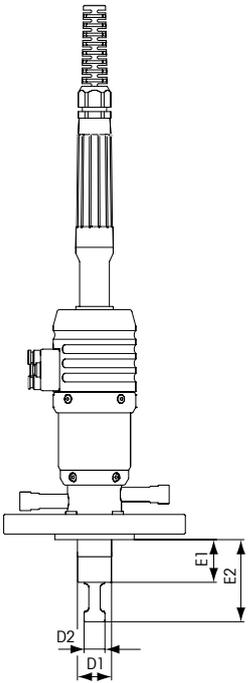
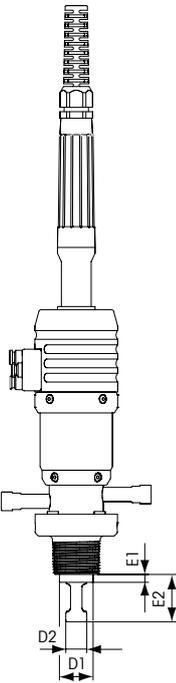
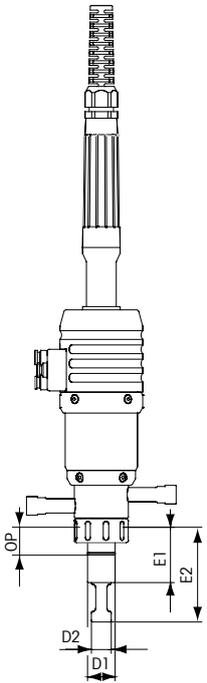
Legend: R: Pneumatic check back
M: Manual
I: Pneumatic, Inductive check back

InTrac 784

InTrac 784 (operation mode R, M and I)						
						
	InTrac 784R		InTrac 784M		InTrac 784I	
Sensor length [mm]	250	450	250	450	250	450
A1 [mm]	219	219	219	219	219	219
A2 [mm]	618	618	618	618	618	618
Recommended space clearance for sensor maintenance; A3 [mm]	850	1050	850	1050	850	1050
B [mm]	98	98	79	79	131	131

Legend: R: Pneumatic check back
M: Manual
I: Pneumatic, Inductive check back

InTrac 78X with various process connections

Process connection InTrac 781/784 (independent of operation mode)						
	Flange AISI 316 L		Flange AISI Alloy C22		NPT thread	Ingold DN 25
						
	InTrac 781/784 (R, M or I)		InTrac 781/784 (R, M or I)		InTrac 781/784 (R, M or I)	InTrac 781/784 (R, M or I)
Sensor length [mm]	225/250	425/450	225/250	425/450	225/250	225/250
E1 [mm]	44	244	39	239	7	51
E2 [mm]	80	280	75	275	43	87
OP [mm]	–	–	–	–	–	25
D1 [mm]	31	36	31	36	31	25
D2 [mm]	19	19	19	19	19	18

Legend: R: Pneumatic check back
M: Manual
I: Pneumatic, Inductive check back

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