



NICO PRESSURE TRANSMITTERS

PTP30 • PTH13 • DPT11

Compact, Smart Pressure
and
Differential Pressure Measurement



Nikan Sanat Khavarmianeh

2026



NICO

Pressure Transmitters

PTP30 · PTH13 ·
DPT11

Compact, smart pressure and differential-pressure measurement — with diaphragm-seal systems, manifolds and complete differential-pressure flow and level assemblies.



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NICO Pressure Transmitters

Catalogue contents and document control

Approved Ordering Code sections are reproduced without any change to their code structure.

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REVISION AND CONTROL

Document control block

Document title	NICO Pressure Transmitters Catalogue	Document number	NICO-CAT-PT-001
Revision	Rev01	Issue date	2026
Prepared by	NICO Engineering	Approved by	Nikan Sanat Khavarmiyaneh (NICO)
Publication status	Public Release	Ordering Codes	PTH13 R4.5 · DPT11 R4.4 · DST41 R0
Revision description	First public release of the NICO pressure-transmitter programme: PTP30, PTH13 and DPT11 with the DST41 diaphragm-seal system, manifolds and complete differential-pressure flow and level assemblies.		

CHAPTER 1 · PRODUCT PROGRAMME

NICO Pressure Measurement Family

One programme covering gauge, absolute and differential pressure

The three transmitter platforms, and the linked equipment that completes each measurement point.

1 Three transmitters — one measurement programme

Compact pressure, smart process pressure and differential pressure, supported by diaphragm-seal systems, manifolds and complete measurement assemblies.

PTP30

Compact Pressure Transmitter

Pen-type transmitter for machines, hydraulic and pneumatic systems, OEM equipment and utility points. Gauge and absolute measurement in one compact body; the local display is an option, not a separate model.



PTH13

Smart Pressure Transmitter

Gauge and absolute process pressure with 4...20 mA, HART protocol, 2-wire output, optional local display, a wide material choice and direct or diaphragm-seal process interfaces. The standard instrument for plant pressure points and open-tank level.



DPT11

Differential Pressure Transmitter

Differential pressure for flow across a primary element, hydrostatic and closed-tank level, and filter or strainer monitoring. Manifold-assembly and diaphragm-seal ready.



MEASUREMENT REQUIREMENT — RECOMMENDED PRODUCT

MEASUREMENT REQUIREMENT	PRODUCT	DESCRIPTION
Equipment and machine pressure — compact installation	PTP30	Compact pressure transmitter
Process pressure with local display and HART protocol	PTH13	Smart pressure transmitter
Open or vented-tank hydrostatic level	PTH13	With a direct-mounted or remote DST41 seal
Differential pressure, flow and closed-tank level	DPT11	Differential pressure transmitter

THE COMPLETE MEASUREMENT POINT

Each transmitter is supplied as part of an engineered measurement point. The transmitter, the **DST41** diaphragm-seal system, the **ACC53 / ACC54 / ACC55** manifold, **ACC56** root valves, impulse lines and the primary flow element are **separate products with their own model codes**, linked under one Tag No. and never merged into the transmitter code. This principle governs every ordering section of this catalogue.

Measurement

Gauge, absolute and differential pressure; hydrostatic and closed-tank level; differential-pressure flow; filter and strainer monitoring.

Interfaces

Threaded direct connections, factory-assembled manifold packages and DST41 diaphragm-seal systems — direct-mounted or remote-capillary.

Documentation

Calibration certificates, EN 10204 Type 3.1 material certificates and test reports are available with the order; see the standards section.

HOW AN ORDER IS WRITTEN

One Tag No. — separate order lines

1 Transmitter

The PTH13 or DPT11 mother code. It identifies the transmitter configuration and the required assembly interface — a direct connection, a manifold assembly (**M2**, **M3**, **M5**) or preparation for a seal system (**DS**).

2 DST41 seal system

Written only where **CONN = DS**. The complete DST41 code defines the arrangement, seal form, diaphragm material, fill fluid, flange data, capillary and extension.

3 Manifold or primary element

The complete ACC53, ACC54 or ACC55 model code, and where required ACC56 root valves and the primary flow element — each selected from its own controlled document.

One transmitter mother code plus all required linked-equipment order lines under the same Tag No. Every separate product stays on its own order line — there is no limit on the number of lines. No accessory, seal or primary-element code is ever inserted into a transmitter model code, and no application field — **LEVEL**, **FLOW**, **FILT** or similar — exists in any NICO transmitter code. The application is recorded on the instrument datasheet.

HOW TO READ THIS CATALOGUE

MARKING	MEANING
Approved	The section reproduces a NICO-approved controlled Ordering Code without any change to its code structure.
OR	A valid two-character ordering-code value meaning On Request — the configuration is defined by NICO engineering and confirmed with the quotation.
00	A valid two-character ordering-code value meaning none / no additional option.

CHAPTER 2 · PRODUCT PROGRAMME

Product-Family Comparison

Comparison table, quick selection and selection by application

Level and flow are applications of a pressure or differential-pressure transmitter — never a service field in the model code.

2

Product-family comparison and quick selection

Two questions select the platform; the detailed range, connection and material options follow in each product chapter.

FEATURE	PTP30	PTH13	DPT11
Measurement	Gauge · absolute	Gauge · absolute	Differential, bidirectional
Primary duty	Machine, OEM, hydraulic and utility pressure	Plant process pressure; open-tank level with a seal	Flow, closed-tank level, filter ΔP
Output	MA · HA · V5	MA · HA · V5	MA · HA · V5
Local display	Option	D0 · D1	D0 · D1
Diaphragm-seal system	Not applicable	DST41 – DM · R1	DST41 – H1 · L1 · R2
Manifold assembly	Not applicable	M2 – ACC53 · M3 – ACC54	M3 – ACC54 · M5 – ACC55
Mounting bracket	No bracket option	BF · BP	BF · BP
Enclosure protection	Confirmed with quotation	IP65 per IEC 60529	IP65 per IEC 60529
Hazardous area	NX · OR	IA – Ex ia IIC T6 Ga	IA – Ex ia IIC T6 Ga
Ordering Code status	Ordering configuration — page 07	PTH13 Ordering Code R4.5 – page 15	R4.4 – page 27

WHICH TRANSMITTER DO I NEED?

1 Is a single point being measured?

Compact installation · machines · OEM

Limited space, threaded connection, direct mounting on the equipment.
→ **PTP30** — page 05

Process application · display · HART · seals

Plant instrumentation with HART protocol, optional display, direct or diaphragm-seal process interface, wide material choice.
→ **PTH13** — page 10

2 Is the difference between two points being measured?

Flow · level · filter monitoring

Differential pressure across a primary flow element, hydrostatic or closed-tank level, or the pressure drop across a filter or strainer.
→ **DPT11** — page 21

Maximum static / line pressure is a mandatory datasheet input and is not derived from the ΔP range — see page 22.

SELECTION BY APPLICATION

APPLICATION	PRODUCT	SEE
Pump, compressor, hydraulic and machine pressure	PTP30	page 05
General process pressure with HART protocol	PTH13	page 10
Corrosive, viscous or hot media, isolated by a seal	PTH13	pages 13 to 14
Absolute pressure and sealed vessels	PTH13	page 15
Open or vented-tank hydrostatic level	PTH13	page 14
Orifice, venturi or nozzle flow measurement	DPT11	pages 36 to 39
Closed-tank level, impulse legs or remote seals	DPT11	pages 24 to 26
Filter and strainer monitoring, HVAC ΔP	DPT11	page 23

CHAPTER 3 · PTP30

PTP30 Compact Pressure Transmitter

Product description, applications, approved product image and selection guidance

Compact pen-type pressure measurement for machines, OEM equipment and utility service.

3

PTP30 — Compact Pressure Transmitter

Pen-type pressure measurement for machines, OEM equipment and utility service

The product

PTP30

The PTP30 is a compact, pen-type pressure transmitter for direct mounting on machines and equipment. One compact body covers gauge and absolute measurement; the local display is an option, not a separate model. The stainless-steel construction and threaded process connection make it a universal instrument for equipment builders and utility measurement.

The transmitter is mounted directly on its process connection. **PTP30 has no mounting-bracket option.** Flanged connections, diaphragm seals and capillary systems are not part of the PTP30 platform — they are provided by PTH13 and DPT11 with the DST41 seal system.

Typical applications

Hydraulic systems · Pneumatic systems · Pumps and compressors
Machine building and OEM equipment · Utility pressure points · Test benches

Key features

- Compact SS304 body, gauge and absolute measurement in one platform
- 4...20 mA, 2-wire; HART protocol and 1...5 V on request
- Optional local display
- M20 × 1.5 standard process connection with G and NPT alternatives
- Plug-connector or cable electrical connection



PTP30 Compact Pressure Transmitter — with local display (left) and without display (right). One compact body; the display is an option, not a separate model. The plug-connector electrical connection and the threaded process connection are visible on both versions.

SELECTION GUIDANCE

When PTP30 is the correct platform

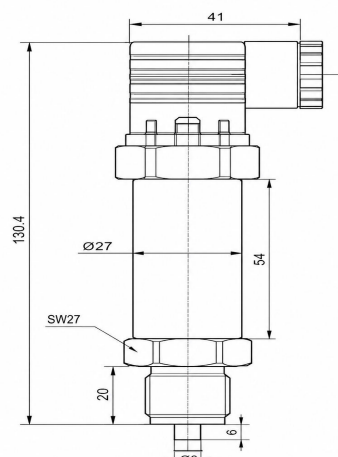
REQUIREMENT	PLATFORM	REASON
Compact installation on a machine or skid	PTP30	Small installed envelope; direct mounting on the process connection
Hydraulic or pneumatic equipment pressure	PTP30	Threaded connection, SS304 wetted part, ranges to 0–700 bar gauge
Utility pressure point or test bench	PTP30	Simple two-wire loop, optional display
Local display with HART configuration and a wide material choice	PTH13	Smart platform with six wetted materials and DST41 seal capability
Hot, corrosive, viscous or crystallising media	PTH13 + DST41	The process is isolated by a diaphragm seal — not a PTP30 duty
Flanged or vessel connection, or open-tank level	PTH13 + DST41	PTP30 has no flanged or diaphragm-seal interface
Differential pressure, flow or closed-tank level	DPT11	Two process connections are required

Protection accessories. Snubbers, gauge savers and siphons are available for pulsating or hot service. They are separate accessories with their own model codes and are never inserted into the PTP30 ordering code.

REFERENCE

Dimensions

Principal outline drawings of the PTP30 transmitter.



CHAPTER 3 · PTP30

PTP30 Technical Specifications

Specifications and installation guidance

Performance depends on the selected measuring range and configuration. Refer to the applicable NICO datasheet or quotation for guaranteed values.

PTP30 TECHNICAL SPECIFICATIONS

For the selected configuration

Measurement type	Gauge or absolute pressure	Range capability	Gauge 0–0.1 ... 0–700 bar · absolute to 0–350 bar
Output signal	4...20 mA, 2-wire; HART protocol and 1...5 V, 3-wire on request	Supply voltage	10.5–45 V DC
Process connection	M20 × 1.5 standard · G½ · G¾ · ½ NPT · ¼ NPT	Electrical connection	Plug connector or cable version
Wetted material	SS304	Housing material	SS304, non-wetted
Sealing element	FPM	Mounting	Direct on the process connection — no bracket option
Ambient temperature	–30 ... +85 °C	Process temperature	–30 ... +85 °C
Hot media beyond the stated process range	Use a siphon or an impulse line — consult NICO. The siphon or impulse line is a separate accessory.		
Dimensions	The approved dimensional drawing is supplied for the selected configuration with the order documentation. Request it from NICO before designing the installation.		

Performance depends on the selected measuring range and configuration. Refer to the applicable NICO datasheet or quotation for guaranteed values. Measuring range, overpressure and proof pressure are three separate limits and are stated separately on the datasheet for the selected range.
PTP30 ordering configuration — final model selection confirmed with the quotation.

INSTALLATION GUIDANCE

Direct mounting

The PTP30 is supported by its own process connection. Tighten on the hexagon flat only — never on the housing or the electrical connection.

Pulsation and spikes

Fit a snubber or gauge saver where the service pulsates, for example on the discharge of a positive-displacement pump or compressor.

Hot media

Fit a siphon or an impulse line so the medium at the transmitter stays within the stated process-temperature range.

Electrical connection

State the required connector type or cable length with the enquiry — it is a datasheet input, not an ordering-code field.

Orientation

Mount so that the display, where fitted, is readable and the electrical entry is not exposed to standing water or direct washdown.

Calibration access

Where periodic verification is required, provide an isolation and calibration connection in the piping — the PTP30 has no manifold interface.

CHAPTER 4 · PTP30 ORDERING CONFIGURATION

Product code, pressure type, ranges, output, connections, display and material

PRODUCT CODE

Select one option in each field and combine them in sequence

PTP30	1 TYPE Pressure type	2 RANGE Measuring range	3 OUT Output	4 CONN Process connection	5 ELEC Electrical connection	6 DISP Display	7 MAT Wetted material	8 EX Hazardous area	9 OPT... Options
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CODE CONVENTIONS — every selectable value is exactly two characters. **00** none / no additional option · **OR** On Request — the configuration is defined by NICO engineering and confirmed with the quotation. Combine one value from each field in the printed sequence.

FIELDS 1 AND 2 — PRESSURE TYPE AND MEASURING RANGE

1 bar = 14.5038 psi

1 TYPE	Pressure type
GP	Gauge pressure
AP	Absolute pressure Ranges 01 ... 07
OR	On Request / NICO engineering review
Absolute measurement is available up to 0–350 bar; ranges 08 and 09 are gauge only.	

RANGE — MEASURING RANGE

CODE	RANGE (BAR)	RANGE (PSI)	AP	TYPICAL SERVICE
01	0 ... 0.1	0 ... 1.45	✓	Low pressure, ventilation
02	0 ... 0.4	0 ... 5.80	✓	Low pressure
03	0 ... 1	0 ... 14.5	✓	Pneumatics, utility
04	0 ... 4	0 ... 58.0	✓	Pneumatics, general machine
05	0 ... 10	0 ... 145	✓	Water systems, utility
06	0 ... 40	0 ... 580	✓	Machine hydraulics
07	0 ... 100	0 ... 1450	✓	Hydraulics
08	0 ... 400	0 ... 5802	—	High-pressure hydraulics
09	0 ... 700	0 ... 10153	—	High-pressure test, hydraulics

Range selection. Intermediate and special calibrated ranges within these limits are set at order. **Overpressure is a separate limit from the measuring range** and is stated on the applicable NICO datasheet for the selected range. Performance depends on the selected measuring range and configuration — refer to the applicable NICO datasheet or quotation for guaranteed values.

FIELDS 3, 4 AND 5 — OUTPUT, PROCESS CONNECTION AND ELECTRICAL CONNECTION

3 OUT	Output signal
MA	4...20 mA, 2-wire Standard
HA	4...20 mA, HART protocol, 2-wire On Request
V5	1...5 V, 3-wire On Request
Available configurations confirmed with quotation.	

CONN — PROCESS CONNECTION

CODE	CONNECTION	STANDARD
MT	M20 × 1.5 direct process connection	ISO 261 — standard
G2	G½ direct process connection	ISO 228-1
G4	G¾ direct process connection	ISO 228-1
N2	½ NPT direct process connection	ASME B1.20.1
N4	¾ NPT direct process connection	ASME B1.20.1
OR	On Request / NICO engineering review	—

5 ELEC	Electrical connection
PC	Plug connector Standard
CB	Cable version
OR	On Request / NICO engineering review
The connector type, cable length, cable gland and entry thread are stated on the datasheet and are not model-coded.	

6 DISP	Display
D0	Without local display
D1	With local display
The local display is an option of one body, not a separate model.	

7 MAT	Wetted material
S4	SS304
OR	On Request / NICO engineering review
Sealing element FPM. Housing SS304, non-wetted. Wetted and non-wetted materials are specified separately.	

CHAPTER 4 · PTP30 ORDERING CONFIGURATION

Hazardous area, options and certificates

FIELDS 8 AND 9 — HAZARDOUS AREA AND OPTIONS

8 EX	Hazardous area	9 OPT...	Options
NX	Non-Ex industrial version	00	No additional option
OR	Hazardous-area configuration; NICO engineering review	M1	Material certificate EN 10204 Type 3.1
	A hazardous-area requirement is handled as OR and confirmed with the quotation.	CN	NICO in-house calibration certificate
		CT	Third-party accredited ISO/IEC 17025 calibration certificate Additional cost
		OR	On Request / NICO engineering review
		Repeatable field. Controlled order: M1 → CN or CT .	

Option rules. **00** cannot be combined with another option. · **CN** and **CT** are mutually exclusive. · **M1** and one calibration option may be combined. · **OR** requires NICO engineering review. · **PTP30 has no mounting-bracket option.** The transmitter is mounted directly on its process connection. · Snubbers, gauge savers and siphons are separate accessories with their own model codes and are never inserted into the PTP30 code.

CN — NICO in-house calibration certificate: calibration performed and certificate issued by NICO in accordance with the applicable calibration, traceability and reporting procedures. It shall not be described as an accredited ISO/IEC 17025 certificate unless the applicable NICO accreditation explicitly covers the measurand and range.

CT — Third-party accredited ISO/IEC 17025 calibration certificate — additional cost. Issued by an independent laboratory accredited to ISO/IEC 17025 for the applicable measurand and pressure range.

SL — SIL 2 capability — NICO Manufacturer Declaration; availability and applicable restrictions confirmed with quotation. This is a NICO manufacturer declaration of functional-safety capability and shall not be presented as an independent third-party SIL certificate.

SELECTION NOTES

Performance depends on the selected measuring range and configuration. Refer to the applicable NICO datasheet or quotation for guaranteed values. Measuring range, overpressure and proof pressure are three separate limits and are stated separately on the datasheet for the selected range. Supply voltage, ambient range and process range for the selected configuration are stated on the applicable NICO datasheet.

PTP30 ordering configuration — final model selection confirmed with the quotation. The transmitter is mounted directly on its process connection; **PTP30 has no mounting-bracket option.** Snubbers, gauge savers and siphons are separate accessories with their own model codes and are never inserted into the PTP30 code.

CHAPTER 4 · PTP30 ORDERING CONFIGURATION

Ordering examples and the engineering data required with the enquiry

ORDERING EXAMPLES

Decoded in the printed field sequence

EXAMPLE 1 — MACHINE PRESSURE POINT

Gauge 0...10 bar · no display

TRANSMITTER

PTP30-GP-05-MA-MT-PC-D0-S4-NX-00

- 1 GP TYPE** Gauge pressure
2 05 RANGE 0...10 bar
3 MA OUT 4...20 mA, 2-wire
4 MT CONN M20 × 1.5
5 PC ELEC Plug connector
6 D0 DISP Without display
7 S4 MAT SS304
8 NX EX Non-Ex industrial
9 00 OPT No additional option

EXAMPLE 2 — HYDRAULIC PRESSURE WITH LOCAL INDICATION

Gauge 0...40 bar · cable version · display

TRANSMITTER

PTP30-GP-06-MA-G2-CB-D1-S4-NX-CN

- 1 GP TYPE** Gauge pressure
2 06 RANGE 0...40 bar
3 MA OUT 4...20 mA, 2-wire
4 G2 CONN G½
5 CB ELEC Cable version
6 D1 DISP With display
7 S4 MAT SS304
8 NX EX Non-Ex industrial
9 CN OPT NICO in-house calibration certificate

EXAMPLE 3 — ABSOLUTE PRESSURE WITH HART PROTOCOL

Absolute 0...1 bar · plug connector · display

TRANSMITTER

PTP30-AP-03-HA-N2-PC-D1-S4-NX-M1-CT

- 1 AP TYPE** Absolute pressure
2 03 RANGE 0...1 bar
3 HA OUT 4...20 mA, HART protocol, 2-wire
4 N2 CONN ½ NPT
5 PC ELEC Plug connector
6 D1 DISP With display
7 S4 MAT SS304
8 NX EX Non-Ex industrial
9 M1 OPT EN 10204 Type 3.1
10 CT OPT Third-party ISO/IEC 17025 calibration

HA requires NICO engineering confirmation for the selected configuration. The electrical connector type, cable length and entry thread are stated on the datasheet and are not model-coded.

ENGINEERING DATA REQUIRED WITH THE ENQUIRY

Not part of the model code

Tag number and service description · process medium · maximum operating pressure and temperature · ambient temperature · required calibrated range, LRV and URV · required accuracy · electrical connector type, cable length and entry thread · mounting arrangement · pulsation, vibration or hot-media condition requiring a snubber, gauge saver or siphon · certification and documentation requirement.

CHAPTER 5 · PTH13

PTH13 Smart Pressure Transmitter

Product description, applications and key features

Gauge and absolute process pressure with HART protocol, optional display and DST41 diaphragm-seal capability.

5

PTH13 — Smart Pressure Transmitter

Gauge and absolute process pressure with HART protocol and diaphragm-seal capability.



The product

PTH13

The PTH13 is the NICO smart process pressure transmitter for gauge and absolute measurement. A two-wire 4...20 mA, HART protocol output, an optional local display with push-buttons and a wide choice of process connections and wetted materials make it the standard instrument for plant pressure points. Silicon sensors cover the general and high-pressure duties; a ceramic-capacitive sensor option covers clean media from the lowest ranges.

With a **DST41** diaphragm-seal system the same transmitter measures hot, corrosive, viscous or crystallising media and open-tank hydrostatic level.

Typical applications

Oil & gas · Petrochemical · Chemical plants · Power plants · Water treatment · Utility services
Open and vented-tank hydrostatic level · Sealed pressure points

Key features

- Gauge and absolute measurement
- 4...20 mA, HART protocol, 2-wire
- Optional local display with local configuration
- Threaded direct, manifold-assembly and DST41 diaphragm-seal interfaces
- SS316L to tantalum wetted materials
- Aluminium or stainless-steel housing

One platform

Direct-mount and diaphragm-seal versions are configurations of one transmitter. The electronics, display and output are identical in every configuration.

HART protocol

Remote configuration, re-ranging and diagnostics over the 4...20 mA loop. HART revision and device description are confirmed at quotation stage.

Material choice

Six metallic wetted materials plus a ceramic sensor version for clean-fluid service — see page 13.

PROCESS-INTERFACE PRINCIPLE

How PTH13 is combined with linked equipment

The PTH13 mother code identifies the transmitter configuration and the required assembly interface. **CONN = M2** means the transmitter is supplied as a PTH13 / ACC53 two-valve manifold assembly and **CONN = M3** as a PTH13 / ACC54 three-valve manifold assembly; **CONN = DS** means it is prepared for a separately ordered **DST41** seal system. In both cases the manifold or seal is a separate model code written on its own order line under the same Tag No. The transmitter code never carries the seal arrangement, seal form, flange data, fill fluid or capillary length.

PTH13 Smart Pressure Transmitter with local display — front view. The display is shown powered on with the NICO identity above it. The threaded direct process connection and the two cable entries are visible.

REFERENCE

Dimensions

Principal outline drawings of the PTH13 transmitter.



CHAPTER 5 · PTH13

PTH13 Technical Specifications

Specification table, pressure-limit definitions and hazardous-area version

Measuring range, overpressure and burst pressure are three separate limits and are stated separately.

PTH13 TECHNICAL SPECIFICATIONS

For the selected configuration

Measurement type	Gauge or absolute pressure	Range capability	0–0.1 ... 0–600 bar (0–0.1 bar with the ceramic sensor)
Reference accuracy	±0.2% of calibrated span	Sensor technology	Silicon piezoresistive; ceramic-capacitive option
Output signal	4...20 mA, HART protocol, 2-wire	Supply voltage	10.5–45 V DC
Signal limits	Saturation 3.8 / 20.8 mA · alarm 3.6 / 22.8 mA, selectable	Damping	0–100 s, adjustable
Load resistance	$R_{\max} = (V_{\text{supply}} - 10.5 \text{ V}) / 22.8 \text{ mA}$ — for example 590 Ω at 24 V DC; minimum 250 Ω where HART protocol is used		
Local operation	Optional display with push-buttons	Remote operation	HART communicator or asset-management host
Process connection	¼ / ½ NPT · G¼ · G½ · M20 × 1.5 · ACC53 or ACC54 manifold assembly · DST41 diaphragm seal	Electrical entry	Multiple entries are available; the required entry is a mandatory datasheet input and is not model-coded
Wetted materials	SS316L · Alloy C-276 · Monel 400 · Titanium · Tantalum · gold-plated SS316L · Al ₂ O ₃ ceramic	Housing material	Epoxy-coated aluminium or stainless steel
Enclosure protection	IP65 according to IEC 60529	Mounting	Direct, or on a flat or 2-inch pipe bracket
Process temperature	Depends on the selected process connection and DST41 configuration — state the operating and design temperature with the enquiry.		
Companion manifolds	ACC53 two-valve · ACC54 three-valve — page 35	Seal system	DST41 — pages 31 to 34

Performance depends on the selected measuring range and configuration. Refer to the applicable NICO datasheet or quotation for guaranteed values. Reference accuracy, accuracy under turndown, long-term stability, minimum span and turndown per range are stated on the applicable NICO product datasheet for the selected configuration.

OVERPRESSURE, PROOF AND BURST PRESSURE

Three separate limits

Measuring range is the span over which the transmitter measures. **Overpressure** is the pressure the sensor withstands without permanent change to its characteristics; it is not the same as **proof pressure**, and neither is a **burst-pressure** value. The overpressure rating applicable to the selected range and configuration is stated on the approved product datasheet. Never derive one limit from another.

HAZARDOUS-AREA VERSIONS

IA — ATEX intrinsically safe version — Ex ia IIC T6 Ga. The hazardous-area certification is valid and released. The certificate number and the complete certified marking are reproduced from the valid NICO ATEX certificate in the Standards and Certification chapter and shall not be altered or abbreviated. See the Standards and Certification chapter for the certificate reference.

CHAPTER 6 · PTH13

Sensor Technology Selection

SI piezoresistive silicon versus CR ceramic-capacitive

The sensor selection controls the wetted material, the permitted ranges and whether a DST41 seal system may be used.

6

Sensor technology selection — SI versus CR

Two sensing technologies cover the full span of process duties. The selection is controlled by the range table and by the mandatory compatibility rule.

SI Piezoresistive silicon sensor

A piezoresistive silicon measuring cell isolated from the process by the transmitter isolation diaphragm and its fill system. The metallic isolation diaphragm carries the process; the sensing element never contacts the medium.

Selected for

- general industrial pressure measurement
- metallic isolation-diaphragm construction
- **diaphragm-seal and DST41 applications — SI is the standard sensor**
- open-tank and vented-tank level measurement
- higher-pressure ranges
- viscous, coating or crystallising media when isolated by a seal

CR Ceramic-capacitive sensor

An Al₂O₃ ceramic-capacitive measuring element in which the ceramic diaphragm is itself the process-wetted part, retained by a process seal and elastomer.

Selected only for

- approved direct-process connections
- clean and compatible process fluids
- approved ceramic pressure ranges
- applications where the process seal, elastomer grade and ceramic-cell construction are confirmed

The ceramic process seal and elastomer grade, the maximum temperature and the chemical compatibility for the selected construction are confirmed with the quotation.

MANDATORY COMPATIBILITY RULE

Applies to every PTH13 selection

Sensor / material compatibility — mandatory. CR requires **MAT = CE**. · **CE** is permitted only with **SENS = CR**. · **SI** shall not be combined with **CE**. · DST41 applications use **SENS = SI** as the standard selection. · **CR + DS** is prohibited unless a released NICO construction specifically approves the combination. · The ceramic process seal / elastomer grade, maximum temperature and chemical compatibility for the selected construction are released NICO construction data.

SELECTION COMPARISON

CRITERION	SI — PIEZORESISTIVE SILICON	CR — CERAMIC-CAPACITIVE
Wetted part	Metallic isolation diaphragm — SS316L to tantalum	Al ₂ O ₃ ceramic diaphragm with a process seal and elastomer
Media	General, viscous, coating and crystallising media when isolated by a seal	Clean and compatible fluids only
Pressure ranges	General and higher-pressure ranges	Approved ceramic ranges only
Diaphragm-seal duty	Standard sensor for DST41	Prohibited unless a released NICO construction approves the combination
Open-tank level	Standard selection with a DST41 seal	Not selected
Material code	MAT = S6 · HC · TA · MO · TI · GD	MAT = CE only
Construction status	Released metallic construction	Process seal, elastomer grade and temperature limit confirmed with the quotation

Selecting the range. Select the smallest sensor range that covers the maximum operating pressure of the point — this gives the best accuracy and stability at the calibrated span. State the normal, maximum and design pressure with the enquiry. The permitted sensor/range combinations are controlled by the PTH13 Ordering Code — see the final PTH13 Ordering Code section.

CHAPTER 7 · PTH13

Process Connections, Materials and Configurations

Threaded connections, assembly interfaces, wetted materials and configurations

Flanged and diaphragm-seal interfaces are selected in the DST41 Ordering Code section.

7

PTH13 process connections, materials and configurations

One transmitter — direct-mount, manifold-assembly and diaphragm-seal process interfaces.

THREADED CONNECTIONS

CODE	CONNECTION	STANDARD
N4	¼ NPT	ASME B1.20.1
N2	½ NPT	ASME B1.20.1
G4	G¼	ISO 228-1
G2	G½	ISO 228-1
MT	M20 × 1.5	ISO 261

ASSEMBLY AND SEAL INTERFACES

CODE	INTERFACE
M3	Supplied as a PTH13 / ACC54 three-valve manifold assembly — The applicable ACC54 body and mounting variant for a PTH13 assembly is confirmed with the quotation.
M2	Supplied as a PTH13 / ACC53 two-valve manifold assembly — page 35
DS	Prepared for a separately ordered DST41 seal system — pages 31 to 34
OR	On Request / NICO engineering review

Flanged process interfaces are provided by the **DST41** seal system to **ASME B16.5** or the applicable **DIN / EN** standard confirmed by the released NICO drawing. Nominal sizes, pressure ratings and facings are selected in the DST41 Ordering Code section.

WETTED MATERIALS AND HOUSING

CODE	MATERIAL	TYPICAL SERVICE
S6	SS316L	General process service
HC	Alloy C-276	Acid and chloride-bearing service
M0	Monel 400	Seawater and halide service
TI	Titanium	Oxidising and chloride service
TA	Tantalum	Aggressive acid service
GD	Gold-plated SS316L	Hydrogen permeation duty
CE	Al ₂ O ₃ ceramic	Clean fluids — applies with SENS = CR

CODE	HOUSING	NOTE
AL	Epoxy-coated aluminium	Standard. Non-wetted.
S3	Stainless steel	Corrosive atmospheres, offshore. Non-wetted.

Typical material guidance only. Final material selection requires review of process composition, concentration, temperature, pressure, contaminants, velocity and applicable corrosion data. No material in this table is offered as unconditionally suitable for any named chemical service. Material certification to EN 10204 Type 3.1 is available as option **M1**. Wetted and non-wetted materials are separately specified and are never interchanged.

PTH13 PROCESS CONFIGURATIONS

Configurations of one transmitter, not separate models

CONFIGURATION	SELECTION	TYPICAL SERVICE
Direct mount	N4 · N2 · G4 · G2 · MT	Clean liquids and gases, standard duty
Manifold assembly	M2 + ACC53 · M3 + ACC54	Plant pressure points requiring isolation and a calibration connection
Direct-mounted seal	DS + DST41 DM	Viscous, corrosive or hot media; no dead pocket at the process face
Remote seal with capillary	DS + DST41 R1	Hot media, remote or vibrating measurement points, open-tank level
Extended-diaphragm seal	DS + DST41 SE	Build-up and crystallising media, lined or insulated nozzles

The electronics, output and display are identical in every configuration. The mechanical execution of each configuration is defined by the approved NICO drawing for the selected process connection and seal.

CHAPTER 7 · PTH13 APPLICATIONS

Pressure and Open-Tank Level

Hydrostatic level measurement with a gauge-pressure transmitter

Level is an application of the transmitter — it is never a field in the model code.

HOW A PRESSURE TRANSMITTER MEASURES LIQUID LEVEL

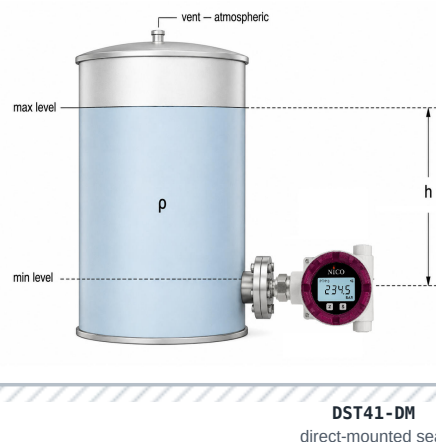
A column of liquid exerts a pressure at its base that is proportional to the height of the column and to the density of the liquid. In an open or vented tank the vapour space is at atmospheric pressure, so a **gauge-pressure** transmitter connected at the bottom of the tank measures the hydrostatic pressure of the column directly.

$$h = P / (\rho \cdot g)$$

h — liquid height above the measuring point (m) · P — measured gauge pressure (Pa) · ρ — liquid density (kg/m³) · g — 9.80665 m/s²

Density governs the result. The transmitter measures pressure, not height. A change in liquid density changes the indicated level for the same physical height. State the operating density — and its variation with temperature and composition — with the enquiry.

FIGURE 1



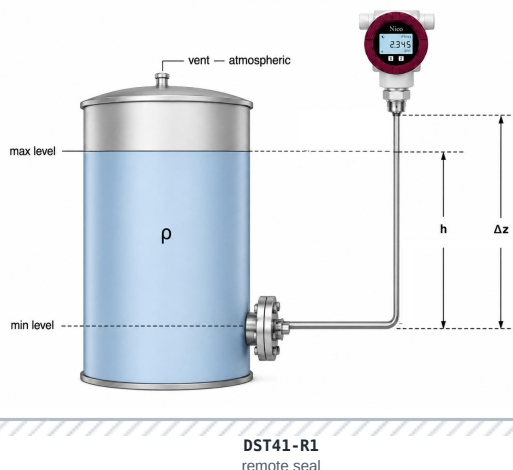
Open or vented tank — PTH13 with a direct-mounted DST41 seal. The seal is flanged to the lower nozzle and the transmitter is mounted directly on it; there is no capillary and no static head between the seal and the sensor. Arrangement **DM** with **CAP = C0**.

SELECTING THE ARRANGEMENT

DST41	WHEN IT IS SELECTED
DM	The transmitter can be mounted at the nozzle. Fastest response, no capillary, no fill-fluid static head.
R1	The transmitter must be remote from the nozzle — high process temperature, vibration, poor access or a required indication position.
OR	Special or asymmetric arrangements; NICO engineering review.

Static head of the fill fluid. With **R1** the fill-fluid column in the capillary adds a constant pressure that depends on the fill-fluid density and on Δz . It is compensated by calibration, but it consumes part of the measuring range and it shifts the zero — state the seal elevation relative to the transmitter with the enquiry. Capillary length also affects response time, ambient-temperature influence and zero shift; select the shortest practical capillary.

FIGURE 2



Open tank — PTH13 with a remote DST41 seal. Arrangement R1. The capillary is filled with the selected fill fluid; the elevation Δz between the seal and the transmitter produces a constant static head that is compensated during calibration.

Level is an application, not a service code. Open-tank level is ordered as a standard PTH13 gauge-pressure transmitter with the appropriate connection and, where required, a separately ordered DST41 seal system. **No LEVEL, FLOW, FILT or other service field exists in the PTH13 or DPT11 model code,** and none shall be added. The application is recorded on the datasheet and in the engineering worksheet.

WORKED SELECTION SEQUENCE

Open or vented tank

1 Establish the minimum and maximum level and the operating density. **2** Calculate the hydrostatic pressure at maximum level from $h = P / (\rho g)$, rearranged as $P = \rho \cdot g \cdot h$. **3** Select the smallest PTH13 range that covers that pressure plus the required margin. **4** Select **SENS = SI** — the standard sensor for sealed and level duty. **5** Select the process connection: a direct code for a clean, temperate service, or **CONN = DS** where a seal is required. **6** Where **DS** is selected, specify the DST41 system on its own order line and state the seal elevation, capillary length and fill fluid. **7** State the required LRV and URV and any zero suppression or elevation.

CHAPTER 8 · PTH13 ORDERING CODE R4.5

Product code, pressure type, sensor technology and measuring ranges · NICO-OC-PTH13-R4.5

PRODUCT CODE

Select one option in each field and combine them in sequence

PTH13	1 TYPE Pressure type	2 SENS Sensor	3 RANGE Measuring range	4 CONN Connection	5 OUT Output	6 DISP Display	7 MAT Sensor material	8 HSG Housing	9 EX Hazardous area	10 OPT... Options
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CODE CONVENTIONS — every selectable value is exactly two characters. **00** none / no additional option · **OR** On Request — the configuration is defined by NICO engineering and confirmed with the quotation. Combine one value from each field in the printed sequence.

FIELDS 1 AND 2 — PRESSURE TYPE AND SENSOR TECHNOLOGY

1 TYPE Pressure type GP Gauge pressure AP Absolute pressure Silicon ranges 04 · 05 · 06 OR On Request Absolute pressure is available on ranges 04 · 05 · 06 . All other ranges are OR .	2 SENS Sensor technology SI Piezoresistive silicon sensor CR Ceramic-capacitive sensor OR On Request Permitted sensor / range combinations are controlled by the range table below.
--	---

FIELD 3 — RANGE AND SENSOR COMPATIBILITY

1 bar = 14.5038 psi

CODE	RANGE (BAR)	RANGE (PSI)	SENSOR	CODE	RANGE (BAR)	RANGE (PSI)	SENSOR
01	0 ... 0.1	0 ... 1.45	CR	07	0 ... 10	0 ... 145	CR
02	0 ... 0.2	0 ... 2.90	CR	08	0 ... 20	0 ... 290	CR
03	0 ... 0.4	0 ... 5.80	SI · CR	09	0 ... 40	0 ... 580	SI · CR
04	0 ... 1	0 ... 14.5	SI · CR	10	0 ... 70	0 ... 1015	CR
05	0 ... 2	0 ... 29.0	SI · CR	11	0 ... 400	0 ... 5802	SI
06	0 ... 4	0 ... 58.0	SI · CR	12	0 ... 600	0 ... 8702	SI

Range selection. The permitted sensor / range combinations are controlled by the table above. Performance depends on the selected measuring range and configuration — refer to the applicable NICO datasheet or quotation for guaranteed values. Measuring range, overpressure and proof pressure are three separate limits.

HOW TO SELECT THE SENSOR TECHNOLOGY

SI Piezoresistive silicon sensor · general industrial pressure measurement · metallic isolation-diaphragm construction · diaphragm-seal and DST41 applications — SI is the standard sensor · open-tank and vented-tank level measurement · higher-pressure ranges · viscous, coating or crystallising media when isolated by a seal	CR Ceramic-capacitive sensor · approved direct-process connections only · clean and compatible process fluids · approved ceramic pressure ranges · process seal, elastomer grade, temperature limit and chemical compatibility remain confirmed with the quotation
--	--

SI is a piezoresistive silicon measuring cell isolated from the process by the transmitter isolation diaphragm and fill system. **CR** is an Al₂O₃ ceramic-capacitive measuring element. **CR shall not be selected with DST41** unless an approved NICO construction confirms the combination.

CHAPTER 8 · PTH13 ORDERING CODE R4.5

Field 4 — transmitter connection and manifold-assembly selection guidance

FIELD 4 — CONN · TRANSMITTER CONNECTION

CODE	CONNECTION OR ASSEMBLY
N4	¼ NPT direct process connection
N2	½ NPT direct process connection
G4	G¾ direct process connection
G2	G½ direct process connection
MT	M20 × 1.5 direct process connection
M2	Supplied as a PTH13 / ACC53 two-valve manifold assembly
M3	Supplied as a PTH13 / ACC54 three-valve manifold assembly
DS	Prepared for a separately ordered DST41 seal system
OR	On Request / NICO engineering review

The **PTH13 mother code identifies the transmitter configuration and the required assembly interface**. The detailed manifold construction remains defined by the separately specified **ACC53** or **ACC54** model code, written on its own order line under the same Tag No. The complete manifold code is never inserted into the PTH13 mother code. · **M2 — ACC53 two-valve manifold**: one block valve plus one bleed / vent valve. · **M3 — ACC54 three-valve manifold**: two block valves plus one equalising valve. · **M2 and M3 are alternative CONN selections**. They are not repeatable options and never appear in the **OPT** field. Any other manifold interface is handled through **OR**. · **DS** — the transmitter is prepared for a separately ordered **DST41** seal system; see the **DST41 Ordering Code section**. The transmitter code never carries the seal arrangement, form, flange data, fill fluid or capillary length.

Factory-assembled package. With **M2** or **M3** the transmitter is supplied assembled on the manifold: mechanical assembly, correct valve orientation, thread and seal preparation, torque control, leak or pressure test as applicable, final inspection and common identification under the same Tag No. **M3 — ACC54 mechanical interface**: the applicable ACC54 body and mounting variant is confirmed with the quotation.

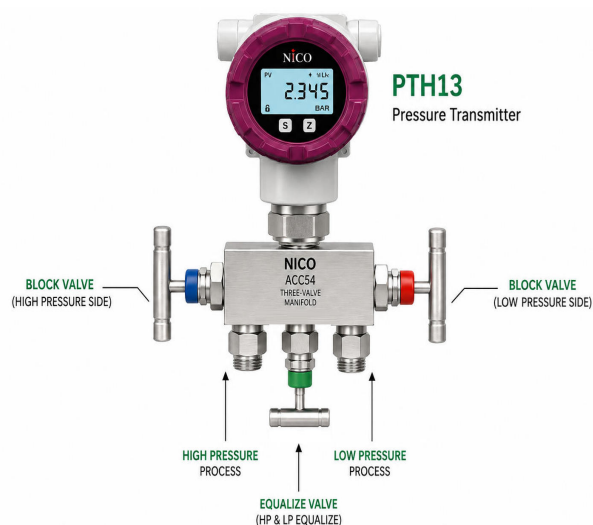
MANIFOLD-ASSEMBLY SELECTION GUIDANCE

CODE	WHEN IT IS SELECTED
M2	The standard PTH13 manifold arrangement for isolation and bleed / vent or calibration access. One block valve plus one bleed / vent valve, supplied as a PTH13 / ACC53 assembly.
M3	Available only where the ACC54 port function, body type and mounting interface have been confirmed compatible with PTH13 by a released NICO drawing. Two block valves plus one equalising valve, supplied as a PTH13 / ACC54 assembly.
OR	Any unverified ACC54 variant shall be OR, together with any other manifold interface. NICO engineering review applies.

The complete **ACC53** or **ACC54** model code is written on its own order line under the same Tag No. and is never inserted into the PTH13 mother code.

M2 and M3 are alternative CONN selections

PTH13 / ACC54 ASSEMBLY — VALVE PATHS



Functional schematic of the PTH13 / ACC54 three-valve arrangement: two process connections, two **block** valve paths isolating the transmitter, and the **equalise** path across the two legs. It shows the valve function only — it is not a construction or interface drawing, and it does not imply that every ACC54 variant is compatible with PTH13.

CHAPTER 8 · PTH13 ORDERING CODE R4.5

Output, display, materials, housing, hazardous area and options

FIELDS 5 AND 6 — OUTPUT SIGNAL AND DISPLAY

5 OUT	Output signal	6 DISP	Display
MA	4...20 mA, 2-wire Standard	D0	Without local display
HA	4...20 mA, HART protocol, 2-wire Standard	D1	With local display
V5	1...5 V, 3-wire On Request	The local display is an option of one transmitter body, not a separate model. Selecting D0 or D1 does not change the selected OUT code. Ambient-temperature and hazardous-area compatibility shall be verified for the selected display configuration.	
V5 requires NICO engineering confirmation.			

Output. **MA** — 4...20 mA, 2-wire — Standard · **HA** — 4...20 mA, HART protocol, 2-wire — Standard · **V5** — 1...5 V, 3-wire — On Request. **V5** requires NICO engineering confirmation. Ex availability for each output shall be verified against the released Ex certificate; HART revision and configuration are confirmed at quotation stage. **Ex, SIL, output, housing, display and electrical-connection compatibility shall be verified against the released certificates and product configuration matrix.**

FIELDS 7 TO 10 — MATERIALS, HOUSING, HAZARDOUS AREA AND OPTIONS

7 MAT	Sensor / isolation-diaphragm material	8 HSG	Electronic housing
S6	SS316L	AL	Aluminium housing
HC	Hastelloy C-276	S3	Stainless-steel housing
TA	Tantalum	Non-wetted housing. Enclosure protection: IP65 according to IEC 60529.	
M0	Monel 400		
TI	Titanium		
GD	Gold-plated SS316L		
CE	Al ₂ O ₃ ceramic Applies with SENS = CR		
OR	On Request		

Sensor / material compatibility — mandatory. **CR** requires **MAT = CE**. · **CE** is permitted only with **SENS = CR**. · **SI** shall not be combined with **CE**. · DST41 applications use **SENS = SI** as the standard selection. · **CR + DS** is prohibited unless a released NICO construction specifically approves the combination. · The ceramic process seal, elastomer grade and the applicable temperature and chemical compatibility are confirmed with the quotation.

9 EX	Hazardous area	10 OPT...	Options
NX	Non-Ex industrial version	00	No additional option
IA	ATEX intrinsically safe version Ex ia IIC T6 Ga	M1	Material certificate EN 10204 Type 3.1
OR	Special hazardous-area configuration; NICO engineering review	CN	NICO in-house calibration certificate
		CT	Third-party accredited ISO/IEC 17025 calibration certificate Additional cost
		SL	SIL 2 capability — NICO Manufacturer Declaration Availability and applicable restrictions confirmed with quotation
		BF	Flat mounting bracket
		BP	2-inch pipe-mounting bracket
		OR	On Request / NICO engineering review
		Repeatable field. Controlled order: M1 → CN or CT → SL → BF or BP .	

IA — ATEX intrinsically safe version — Ex ia IIC T6 Ga. The certificate number, complete certified marking, permitted ambient-temperature range and entity parameters are stated in the applicable valid NICO ATEX certificate, available with the quotation or on request. Output, display, housing and connection combinations selected with **IA** are verified against that certificate.

CHAPTER 8 · PTH13 ORDERING CODE R4.5

Option rules, certificates, functional-safety status and application selection

OPTION RULES AND CERTIFICATES

Option rules. **00** cannot be combined with another option. · **CN** and **CT** are mutually exclusive. · **BF** and **BP** are mutually exclusive. · **M1**, one calibration option, **SL** and one bracket option may be combined. · **OR** requires NICO engineering review. · Controlled order: **M1** → **CN** or **CT** → **SL** → **BF** or **BP**.

CN — NICO in-house calibration certificate: calibration performed and certificate issued by NICO in accordance with the applicable calibration, traceability and reporting procedures. It shall not be described as an accredited ISO/IEC 17025 certificate unless the applicable NICO accreditation explicitly covers the measurand and range.

CT — Third-party accredited ISO/IEC 17025 calibration certificate — additional cost. Issued by an independent laboratory accredited to ISO/IEC 17025 for the applicable measurand and pressure range.

SL — SIL 2 capability — NICO Manufacturer Declaration; availability and applicable restrictions confirmed with quotation. This is a NICO manufacturer declaration of functional-safety capability and shall not be presented as an independent third-party SIL certificate.

APPLICATION SELECTION — NOT PART OF THE MODEL CODE

APPLICATION	SELECTION GUIDANCE
Direct pressure measurement	GP or AP with a direct CONN code
Pressure with a two-valve manifold assembly	CONN = M2 + complete ACC53 model on its own order line
Pressure with a three-valve manifold assembly	CONN = M3 + complete ACC54 model on its own order line
Pressure with a direct-mounted seal	CONN = DS + DST41 arrangement DM
Open or vented-tank level	GP + SI + CONN = DS + DST41 arrangement R1
Closed-tank level	DPT11 required
Special duty	OR — NICO engineering review

CHAPTER 8 · PTH13 ORDERING CODE R4.5

Direct, two-valve and three-valve ordering examples

ORDERING EXAMPLES

Each separate product on its own order line

One transmitter mother code plus all required linked-equipment order lines under the same Tag No. Every separate product remains on its own order line. There is no maximum number of linked-equipment order lines.

EXAMPLE 1 — DIRECT PRESSURE MEASUREMENT

Gauge 0...1 bar · silicon · ½ NPT

TRANSMITTER

PTH13-GP-SI-04-N2-HA-D1-S6-AL-NX-CN

- 1 **GP TYPE** Gauge pressure
- 2 **SI SENS** Silicon sensor
- 3 **04 RANGE** 0...1 bar
- 4 **N2 CONN** ½ NPT direct
- 5 **HA OUT** 4...20 mA, HART protocol, 2-wire
- 6 **D1 DISP** With display
- 7 **S6 MAT** SS316L
- 8 **AL HSG** Aluminium
- 9 **NX EX** Non-Ex industrial
- 10 **CN OPT** NICO in-house calibration certificate

EXAMPLE 2 — PTH13 / ACC53 TWO-VALVE MANIFOLD ASSEMBLY

Gauge 0...1 bar · two-valve block and bleed

TRANSMITTER

PTH13-GP-SI-04-M2-HA-D1-S6-AL-NX-M1-CN

- 1 **GP TYPE** Gauge pressure
- 2 **SI SENS** Silicon sensor
- 3 **04 RANGE** 0...1 bar
- 4 **M2 CONN** Assembled with ACC53
- 5 **HA OUT** 4...20 mA, HART protocol, 2-wire
- 6 **D1 DISP** With display
- 7 **S6 MAT** SS316L
- 8 **AL HSG** Aluminium
- 9 **NX EX** Non-Ex industrial
- 10 **M1 OPT** EN 10204 Type 3.1
- 11 **CN OPT** NICO in-house calibration certificate

INCLUDED MANIFOLD — SEPARATELY SPECIFIED ON ITS OWN ORDER LINE

ACC53 Two-valve manifold — complete model code shall be selected from the NICO Accessories Catalogue

EXAMPLE 3 — PTH13 / ACC54 THREE-VALVE MANIFOLD ASSEMBLY

Gauge 0...4 bar · two block valves and one equalising valve

TRANSMITTER

PTH13-GP-SI-06-M3-HA-D1-S6-AL-NX-M1-CN

- 1 **GP TYPE** Gauge pressure
- 2 **SI SENS** Silicon sensor
- 3 **06 RANGE** 0...4 bar
- 4 **M3 CONN** Assembled with ACC54
- 5 **HA OUT** 4...20 mA, HART protocol, 2-wire
- 6 **D1 DISP** With display
- 7 **S6 MAT** SS316L
- 8 **AL HSG** Aluminium
- 9 **NX EX** Non-Ex industrial
- 10 **M1 OPT** EN 10204 Type 3.1
- 11 **CN OPT** NICO in-house calibration certificate

INCLUDED MANIFOLD — SEPARATELY SPECIFIED ON ITS OWN ORDER LINE

ACC54 Three-valve manifold — complete model code shall be selected from the NICO Accessories Catalogue

M3 — ACC54 assembly. The applicable ACC54 body and mounting variant is confirmed with the quotation. The complete ACC54 model code stays on its own order line under the same Tag No. and is never inserted into the PTH13 mother code.

CHAPTER 8 · PTH13 ORDERING CODE R4.5

Sealed-service ordering example, DST41 quick reference and engineering data

ORDERING EXAMPLE — SEALED AND LEVEL SERVICE

EXAMPLE 4 — OPEN-TANK LEVEL WITH A REMOTE DST41 SEAL
Gauge 0...4 bar · Ex ia IIC T6 Ga · flat bracket

TRANSMITTER
PTH13-GP-SI-06-DS-HA-D1-S6-AL-IA-CT-BF
1 **GP TYPE** Gauge pressure 2 **SI SENS** Silicon sensor 3 **06 RANGE** 0...4 bar 4 **DS CONN** Prepared for DST41
5 **HA OUT** 4...20 mA, HART protocol, 2-wire 6 **D1 DISP** With display 7 **S6 MAT** SS316L 8 **AL HSG** Aluminium 9 **IA EX** ATEX Ex ia IIC T6 Ga
10 **CT OPT** Third-party ISO/IEC 17025 calibration 11 **BF OPT** Flat mounting bracket

DST41 SEAL SYSTEM — ORDERED ON ITS OWN LINE
DST41-R1-SE-S6-S2-AS-F6-A1-RF-C3-E2-00 One remote capillary leg — selected from the DST41 Ordering Code section
DST41 is a separate document — see the Quick Reference below and **the DST41 Ordering Code section** for the full selection.

DST41 QUICK REFERENCE — PTH13

Full selection in the DST41 Ordering Code section

CODE	MEANING	CODE	MEANING	CODE	MEANING
DM	Direct-mounted DST41 seal	SF	Flush Flanged Seal	SE	Extended Flanged Seal
R1	One remote capillary seal	SR	Remote Flanged Seal	DS	PTH13 prepared for separately ordered DST41

Full DST41 code, fill-fluid limits, flange selection, capillary length and compatibility rules are published in **the DST41 Ordering Code section**.

ENGINEERING DATA REQUIRED WITH THE ORDER

Not part of the model code

Sealed pressure: process fluid and phase · operating and design pressure and temperature · ambient temperature range · nozzle drawing, standard, size, rating and facing · wetted-material and corrosion constraints · vacuum, steam-out or cleaning requirement · required response time.

Open-tank level: liquid density · minimum and maximum level · nozzle and transmitter elevation · seal elevation relative to the transmitter · capillary length · fill fluid · required LRV and URV · zero suppression or elevation · process and ambient temperature.

CHAPTER 9 · DPT11

DPT11 Differential Pressure Transmitter

Product description, applications and the three pressure limits

One transmitter body for flow, level, filter monitoring and general differential pressure.

9

DPT11 — Differential Pressure Transmitter

Differential pressure for flow, level and filter monitoring — manifold-assembly and diaphragm-seal ready.

The product

DPT11

The DPT11 measures the difference between two process pressures. One transmitter body covers flow measurement across a primary element, hydrostatic and closed-tank level, filter and strainer monitoring and general differential pressure.

The high-pressure and low-pressure sides are connected either through impulse lines and a manifold, or through a **DST41** diaphragm-seal system. The transmitter can be supplied as a factory-assembled package with an **ACC54** three-valve or **ACC55** five-valve manifold.

Typical applications

Differential pressure · Flow measurement across a primary element
Hydrostatic level · Closed-tank level · Filter and strainer monitoring · HVAC and clean-room ΔP

Key features

- Bidirectional ΔP ranges
- 4...20 mA, HART protocol, 2-wire
- Optional local display with local configuration
- Factory-assembled ACC54 or ACC55 manifold packages
- One, two or no DST41 remote seals — arrangements H1, L1 and R2
- SS316L to tantalum HP / LP isolation diaphragms

Low and micro ΔP

The lowest ΔP ranges serve clean-gas, HVAC and clean-room duty. This is a range selection of the same body — never a separate transmitter family.

Manifold ready

Mounts on NICO three-valve and five-valve manifolds. The mating dimensions follow EN 61518; the manifold remains a separate model code.

Flow and level assemblies

Complete measurement points with primary element, root valves, impulse lines and manifold — pages 36 to 37.

THREE PRESSURES — THREE DIFFERENT LIMITS

The most common selection error

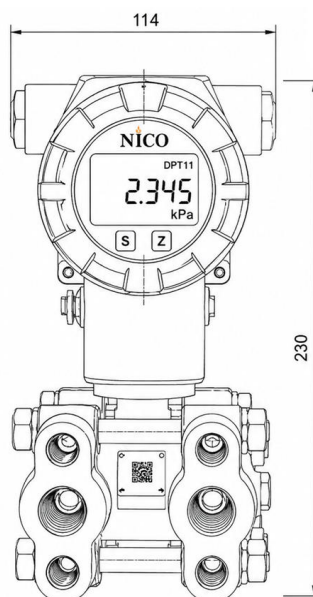
QUANTITY	DEFINITION	WHERE IT IS STATED
Differential pressure range	The measured ΔP between the two ports — the sensor range.	RANGE code, page 27
Static or line pressure	The common process pressure applied to both ports simultaneously. A ± 1 bar ΔP on a high-pressure line is a normal duty.	Mandatory datasheet input — not a code
Single-side overpressure	The short-term limit when pressure acts on one port only — for example during manifold valve operation.	Range table, page 27

All three checks are required. Select the smallest ΔP range that covers the maximum differential pressure, then check the static / line pressure of the point, then check the single-side overpressure against the valve-operation case. None of the three is derived from another, and none of them is a burst-pressure value.

REFERENCE

Dimensions

Principal outline drawings of the PTH13 transmitter.



DPT11 Differential Pressure Transmitter with local display — front view showing both process flanges, the flange bolting and the two process connections on each side. The display is shown powered on with the NICO identity above it.

CHAPTER 9 · DPT11

DPT11 Technical Specifications

Specification table and the ST / HS static-pressure architecture

Maximum static / line pressure is a mandatory datasheet input and is not a public selectable code.

DPT11 TECHNICAL SPECIFICATIONS

For the selected configuration

Measurement type	Differential pressure, bidirectional	Range capability	See the approved range table on page 27
Reference accuracy	±0.2% of calibrated span	Sensor	Differential-pressure capsule with HP / LP isolation diaphragms
Output signal	4...20 mA, HART protocol, 2-wire	Supply voltage	10.5–45 V DC
Signal limits	Saturation 3.8 / 20.8 mA · alarm 3.6 / 22.8 mA, selectable	Damping	0–100 s, adjustable
Load resistance	$R_{\max} = (V_{\text{supply}} - 10.5 \text{ V}) / 22.8 \text{ mA}$ — for example 590 Ω at 24 V DC; minimum 250 Ω where HART protocol is used		
Local operation	Optional display with push-buttons	Zero and span	Via HART protocol or the optional display push-buttons
Process connection	¼ / ½ NPT · M20 × 1.5 · ACC54 or ACC55 manifold assembly · DST41 diaphragm seal	Manifold mating dimensions	Per EN 61518 — a mechanical interface, not a code
Wetted materials	SS316L · Alloy C-276 · Monel 400 · Titanium · Tantalum · gold-plated SS316L	Housing material	Epoxy-coated aluminium or stainless steel
Enclosure protection	IP65 according to IEC 60529	Mounting	On the manifold assembly, or on a flat or 2-inch pipe bracket
Process temperature	Depends on the selected process connection and DST41 configuration — state the operating and design temperature with the enquiry.		
Companion manifolds	ACC54 three-valve · ACC55 five-valve — page 35	Seal system	DST41 — pages 31 to 34

STATIC-PRESSURE ARCHITECTURE

ST and HS constructions

TYPE	CONSTRUCTION	SELECTION
ST	Standard differential-pressure construction	Standard selection for differential pressure, flow, filter monitoring and level
HS	High-static-pressure construction	Selected where the line pressure requires it; the applicable static pressure is confirmed with the quotation

Maximum static / line pressure is a mandatory datasheet input on every enquiry. It is stated separately from the differential-pressure range and is never derived from it. Single-side overpressure, maximum static pressure and burst pressure are three separate limits.

HAZARDOUS-AREA VERSIONS

IA — ATEX intrinsically safe version — Ex ia IIC T6 Ga. The certificate number, complete certified marking, permitted ambient-temperature range and entity parameters are stated in the applicable valid NICO ATEX certificate, available with the quotation or on request.

CHAPTER 10 · DPT11 APPLICATIONS

Differential Pressure and Filter Monitoring

General ΔP duty, range selection and manifold operation

The manifold provides isolation, equalisation and the field zero check; it remains a separate model code.

10

DPT11 differential-pressure and filter applications

General differential pressure, filter and strainer monitoring, and the manifold that makes the measurement operable.

GENERAL DIFFERENTIAL PRESSURE

A differential-pressure transmitter measures the difference between two points in the same system. The HP port is connected to the higher-pressure tapping and the LP port to the lower-pressure tapping. Both ports normally see the same static / line pressure at the same time, so the static class of the point is checked independently of the ΔP range.

Typical duties are pressure drop across a filter, strainer, heat exchanger or bed; pressure difference between two vessels; and HVAC or clean-room room-to-room differential.

HP and LP orientation. Reversing the HP and LP connections reverses the sign of the measurement. On a filter the HP port is the upstream (dirty) side and the LP port the downstream (clean) side, so a rising differential indicates a blocking element. Confirm the orientation against the installation drawing before commissioning.

FIGURE 8



DPT11 with an ACC54 three-valve manifold. Two block valves isolate the HP and LP sides; the equalise valve connects both sides for a zero check. Selected by **CONN = M3**; the complete ACC54 model code is written on its own order line.

SELECTING THE RANGE FOR A FILTER OR STRAINER DUTY

1 Establish the clean-condition differential and the alarm or change-out differential. **2** Select the smallest ΔP range that covers the change-out differential with margin. **3** Check the static / line pressure of the point — it is independent of the ΔP range and is a mandatory datasheet input. **4** Check the single-side overpressure against the valve-operation case: during manifold operation, and during a fully blocked element, pressure may act on one port only. **5** Where the possible one-sided pressure exceeds the capsule single-side overpressure limit, an equalising manifold is required and the operating procedure shall equalise before isolating.

MANIFOLD OPERATION

Zero check

Close both block valves, open the equalise valve. Both sides of the capsule then see the same pressure and the output should read the zero differential. This is the routine field verification of a ΔP measurement.

Why the manifold is part of the measurement, not an accessory afterthought

Protecting the capsule

Always equalise before isolating, and isolate before venting. Opening one block valve against a closed second valve applies the full line pressure to one port only — the single-side overpressure case.

Manifold selection depends on isolation, equalisation, venting, testing, maintenance and project piping requirements. **ACC54** is selected where isolation and equalisation are sufficient. **ACC55** is selected where two additional independent vent, drain, test or calibration paths are required. Neither ACC55 nor ACC56 is mandatory for every application — see page 35.

CHAPTER 10 · DPT11 APPLICATIONS

Closed-Tank Level — Impulse-Line Arrangements

Dry leg, wet leg, zero suppression and zero elevation

HP is connected to the lower tapping and LP to the vapour space or upper tapping — in every closed-tank arrangement.

CLOSED AND PRESSURISED TANKS

Both sides of the transmitter are used

In a closed or pressurised tank the vapour space is not at atmospheric pressure. A gauge-pressure transmitter at the bottom of the tank would measure the hydrostatic column **plus** the vapour-space pressure and could not separate them. A **differential-pressure** transmitter solves this: the **HP connection** is taken to the **lower tapping** and the **LP connection** to the **vapour space or upper tapping**, so the vapour pressure acts equally on both sides and cancels. What remains is the hydrostatic column.

$$\Delta P = P_{HP} - P_{LP} = \rho \cdot g \cdot h$$

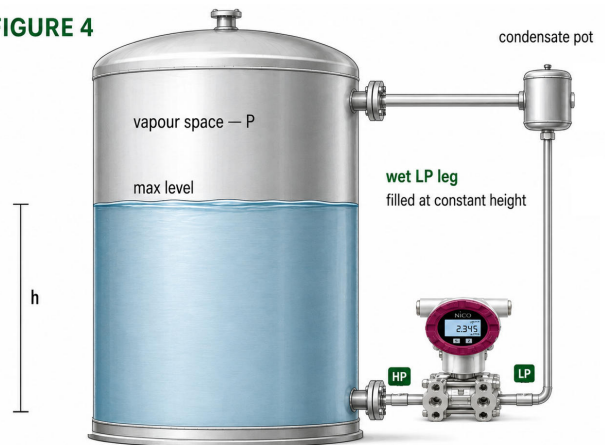
The vapour-space pressure appears on both ports and cancels. h — liquid height above the lower tapping · ρ — liquid density · g — 9.80665 m/s²

FIGURE 3



Dry leg. Used where the vapour does not condense. The LP impulse line stays empty, so it adds no head. At minimum level the HP side already carries the column between the tapping and the datum, so a positive **zero suppression** is applied.

FIGURE 4



Wet leg. Used where the vapour condenses. The LP leg is deliberately kept filled to a constant height, usually from a condensate pot, so it applies a constant negative bias to the measurement. This requires **zero elevation**.

ZERO SUPPRESSION AND ZERO ELEVATION

TERM	CONDITION	EFFECT ON THE CALIBRATED RANGE
Zero suppression	The HP tapping is below the datum of the measured level, so a positive pressure is present at zero level.	The LRV is a positive differential. The calibrated range is shifted upward, for example 5 ... 55 mbar instead of 0 ... 50 mbar.
Zero elevation	A filled LP leg — a wet leg or a remote seal on the LP side — applies a constant head to the low side.	The LRV is a negative differential. The calibrated range is shifted downward, for example -60 ... -10 mbar.

Both are calibration settings, not model codes. They are calculated by NICO from the tapping elevations, the liquid and fill-fluid densities and the required LRV and URV. State these values on the datasheet with the enquiry — they cannot be derived from the transmitter model code.

Wet-leg integrity. A wet leg only performs correctly while it remains full to its design height. Loss of the wet leg through evaporation, draining or a leaking valve produces a false high level. Where the wet leg cannot be maintained reliably, a DST41 remote-seal arrangement on the LP side is the correct solution — see page 26.

CHAPTER 10 · DPT11 APPLICATIONS

Closed-Tank Level — One Remote Seal

DST41 arrangements H1 and L1

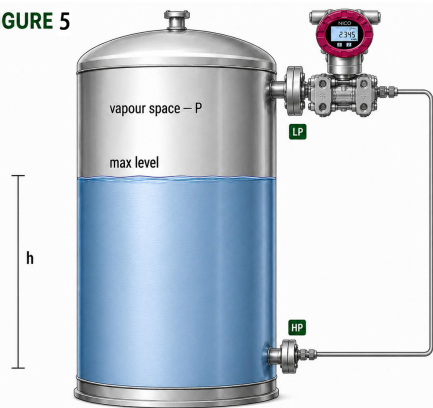
The seal system is ordered on its own line under the same Tag No.; the transmitter code carries only CONN = DS.

CLOSED-TANK LEVEL WITH DST41 REMOTE SEALS

Arrangements H1, L1 and R2 — the seal replaces the impulse leg

Where the process is hot, corrosive, viscous or crystallising, or where an impulse leg cannot be kept in a known condition, the impulse line is replaced by a **DST41** diaphragm seal on a filled capillary. The seal isolates the process; the capillary transmits the pressure to the transmitter through the fill fluid. Each seal leg then applies its own constant static head that is accounted for in the calibration.

FIGURE 5

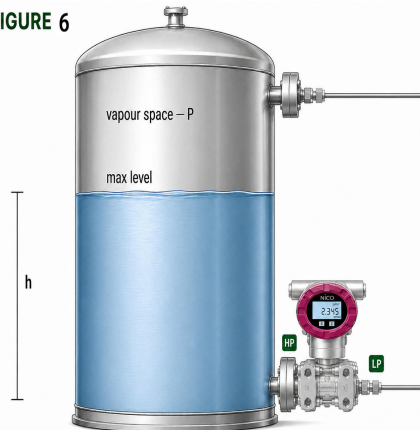


LP side — dry leg, wet leg or impulse line

state the LP construction on the worksheet

H1 — one remote seal on the HP side. The lower tapping is sealed; the LP side remains a direct connection, a dry leg, a wet leg or an impulse line. The LP construction must be stated in the engineering worksheet.

FIGURE 6



HP side — direct process connection or impulse line

state the HP construction on the worksheet

L1 — one remote seal on the LP side. The vapour tapping is sealed, which removes the wet-leg maintenance problem; the HP side remains a direct connection or an impulse line. The HP construction must be stated.

A one-leg DPT11 system uses H1 or L1 — never R1. R1 is the PTH13 one-leg arrangement and does not identify which side of a differential transmitter carries the remote seal; on a DPT11 that ambiguity would reverse the measurement. With **H1** or **L1** the condition of the opposite side — direct process connection, dry leg, wet leg, impulse line or other approved arrangement — shall be stated in the engineering worksheet. **H1 and L1 are defined one-seal arrangements.** Any construction outside the published H1 / L1 rules, or any unlisted difference in seal form, material, fill fluid, capillary construction or connection, shall be handled as **OR** with an HP / LP engineering schedule.

SELECTION SEQUENCE FOR A SEALED CLOSED-TANK SYSTEM

1 Establish the tapping elevations, the minimum and maximum level and the process density. **2** Determine the required ΔP span and the LRV / URV including the seal head. **3** Select the DPT11 range and confirm the static / line pressure. **4** Select **CONN = DS**. **5** Select the DST41 arrangement — **H1, L1** or **R2** — and state the opposite-side construction for a one-leg system. **6** Select the seal form, diaphragm material, fill fluid, flange data, capillary length and extension in the DST41 Ordering Code section. **7** State zero suppression or elevation and the required response time.

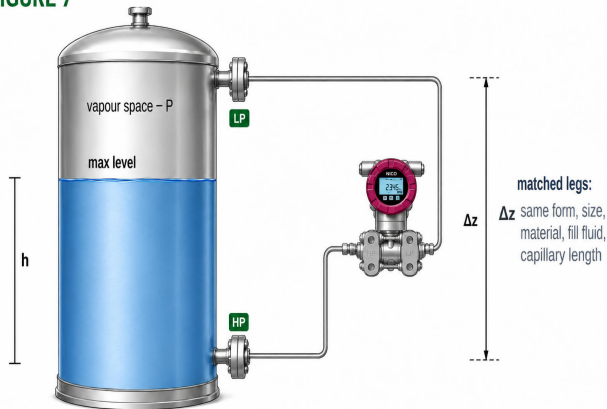
CHAPTER 10 · DPT11 APPLICATIONS

Closed-Tank Level — Two Matched Seals

DST41 arrangement R2, and the effect of fill fluid and capillary head

Level is an application of the transmitter — no LEVEL, FLOW or FILT field exists in any model code.

FIGURE 7



R2 — two matched remote seals. Both tappings are sealed. Matched seal form, diaphragm size, fill fluid, capillary construction and capillary length improve common-mode temperature compensation. Because the HP and LP seals are normally installed at different elevations, their fill-fluid hydrostatic heads are not equal; the resulting elevation head shall be included explicitly in the LRV and URV calculation.

WHEN R2 IS SELECTED

Both tappings carry a difficult service; the vapour space condenses or is corrosive; the wet leg cannot be maintained; or the installation requires the transmitter to be remote from both tappings. **R2** removes both impulse legs and with them the wet-leg maintenance problem, at the cost of two capillary static heads and a slower response.

Matched construction is the normal requirement. Matched seal form, diaphragm size, fill fluid, capillary construction and capillary length improve common-mode temperature compensation. **Because the HP and LP seals are normally installed at different elevations, their fill-fluid hydrostatic heads are not equal. The resulting elevation head shall be included explicitly in the LRV and URV calculation.**

EFFECT OF THE FILL FLUID AND THE CAPILLARY HEAD

Applies to every sealed arrangement — DM, R1, H1, L1 and R2

EFFECT	CAUSE	CONSEQUENCE FOR THE SELECTION
Static head	The fill-fluid column in each capillary leg applies a constant pressure proportional to the fill-fluid density and the elevation.	Consumes part of the measuring range and shifts the zero. State the elevation of each seal relative to the transmitter.
Zero shift	An elevation difference between the HP and LP seals produces a constant differential even at zero level.	Compensated by zero suppression or elevation, calculated by NICO from the stated elevations.
Temperature effect	Fill-fluid density and volume change with ambient temperature, and the two legs may be at different temperatures.	Matched legs and the shortest practical capillary reduce the effect. Ambient range is a mandatory enquiry input.
Response time	The capillary restricts the transfer of volume between the diaphragm and the sensor.	Increases with capillary length and with fill-fluid viscosity. Select the shortest practical capillary.
Vacuum service	A fill fluid can vaporise if the absolute pressure at the seal falls below its vapour pressure at the operating temperature.	Requires vapour-pressure and filling-system review; mount the transmitter at or below the lower seal where practical.
Diaphragm size	A larger diaphragm displaces more volume for the same pressure, improving sensitivity and response.	Determined by NICO engineering from the seal form, flange size, measured range, capillary and required response — it is not a public code field.

The complete sealed system is limited by its most restrictive component. The published fill-fluid temperature references are configuration-dependent and are engineering benchmarks, not released NICO performance limits — see the fill-fluid matrix in the DST41 Ordering Code section. The final limits depend on the qualified fill-fluid source, the filling procedure, the seal form, the diaphragm size, the capillary inside diameter and length, the extension, the process pressure, vacuum, the ambient temperature and the transmitter thermal exposure.

CHAPTER 11 · DPT11 ORDERING CODE R4.4

Product code, transmitter type, connection and differential-pressure ranges · NICO-OC-DPT11-R4.4

PRODUCT CODE

Select one option in each field and combine them in sequence

DPT11	1 TYPE Transmitter type	2 RANGE ΔP range	3 CONN Connection	4 OUT Output	5 DISP Display	6 MAT HP/LP diaphragm	7 HSG Housing	8 EX Hazardous area	9 OPT... Options
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CODE CONVENTIONS — every selectable value is exactly two characters. **00** none / no additional option · **OR** On Request — the configuration is defined by NICO engineering and confirmed with the quotation. Combine one value from each field in the printed sequence.

FIELDS 1 AND 3 — TRANSMITTER TYPE AND CONNECTION

1	TYPE	Transmitter type
ST	Standard differential-pressure transmitter	
HS	High-static-pressure configuration	
OR	On Request / NICO engineering review	

Remote-seal suitability is defined by **CONN = DS** plus a separately ordered DST41 system; there is no separate seal transmitter type.

CONN — TRANSMITTER CONNECTION

CODE	CONNECTION OR ASSEMBLY
N4	¼ NPT direct process connection
N2	½ NPT direct process connection
MT	M20 × 1.5 direct process connection
M3	Supplied as a DPT11 / ACC54 three-valve manifold assembly
M5	Supplied as a DPT11 / ACC55 five-valve manifold assembly
DS	Prepared for a separately ordered DST41 seal system
OR	On Request / NICO engineering review

FIELD 2 — RANGE AND ENGINEERING PROTECTION LIMITS

1 bar = 14.5038 psi

CODE	ΔP (BAR)	ΔP (PSI)	SINGLE-SIDE OVERPRESSURE (BAR)	NOTE
01	±0.01	±0.145	10	Reduced single-side overpressure — verify installation
02	±0.06	±0.87	250	Micro ΔP — a range selection, not a separate model
03	±0.4	±5.8	250	Level and low-ΔP service
04	±1	±14.5	250	General ΔP and flow
05	±2	±29.0	250	General ΔP and flow
06	±4	±58.0	250	Filter monitoring and flow
07	±30	±435	250	High ΔP — TYPE = HS where required
08	±100	±1450	130	High ΔP — TYPE = HS where required

Static pressure is a datasheet input, not a code. Maximum operating static / line pressure is a mandatory datasheet value and is not a public selectable code until released pressure classes are approved. **Single-side overpressure and maximum static pressure are separate limits**; neither is derived from the ΔP range, and neither is a burst-pressure value. For flow measurement the ΔP range follows the primary-element sizing calculation. Minimum span, turndown and accuracy depend on the selected measuring range and configuration — refer to the applicable NICO datasheet or quotation for guaranteed values.

TYPE	CONSTRUCTION	SELECTION
ST	Standard differential-pressure construction	Standard selection for differential pressure, flow, filter monitoring and level
HS	High-static-pressure construction	Selected where the line pressure requires it; the applicable static pressure is confirmed with the quotation

Maximum static / line pressure is a mandatory datasheet input on every enquiry. It is stated separately from the differential-pressure range and is never derived from it. The applicable static-pressure capability for the selected **ST** or **HS** construction is confirmed with the quotation.

HOW TO ORDER

Each separate product on its own order line

1 · Transmitter — select the DPT11 product code. · **2 · DST41 seal system** — where **CONN = DS**, select one DST41 code from **the DST41 Ordering Code section**. · **3 · Manifold or primary element** — where **CONN = M3** or **M5** the manifold is separately specified by its own model code and included in the transmitter assembly package; root valves and primary flow elements are ordered separately. Accessory and seal ordering codes are never inserted into the transmitter code.

CHAPTER 11 · DPT11 ORDERING CODE R4.4

Manifold assembly, output, display, materials, housing, hazardous area and options

MANIFOLD ASSEMBLY — M3 AND M5

The manifold is a separate model

MODEL	FAMILY	VALVE CONFIGURATION
ACC54	Three-valve manifold	Two block plus one equalize
ACC55	Five-valve manifold	Two block plus one equalize plus two vent / test valves

The **DPT11 mother code identifies the transmitter configuration and the required assembly interface**. The detailed manifold construction remains defined by the separately specified **ACC54** or **ACC55** model code, selected from the NICO Accessories Catalogue and written on its own order line under the same Tag No. **M3** and **M5** are not port spacings or thread sizes.

Factory-assembled package. With **M3** or **M5** the transmitter is supplied assembled on the manifold: mechanical assembly, correct valve orientation, thread and seal preparation, torque control, leak or pressure test as applicable, final inspection and common identification under the same Tag No.

DS means the transmitter is prepared for a separately ordered **DST41** seal system — see the **DST41 Ordering Code section**. The transmitter code never carries the seal arrangement, number of legs, seal form, diaphragm material, flange data, fill fluid, capillary length or extension.

FIELDS 4 TO 9 — OUTPUT, DISPLAY, MATERIALS, HAZARDOUS AREA AND OPTIONS

4 OUT Output signal MA 4...20 mA, 2-wire Standard HA 4...20 mA, HART protocol, 2-wire Standard V5 1...5 V, 3-wire On Request V5 requires NICO engineering confirmation.	5 DISP Display D0 Without local display D1 With local display	6 MAT HP / LP isolation diaphragm S6 SS316L HC Hastelloy C-276 TA Tantalum M0 Monel 400 TI Titanium GD Gold-plated SS316L OR On Request	7 HSG Electronic housing AL Aluminium housing S3 Stainless-steel housing Non-wetted housing. Enclosure protection: IP65 according to IEC 60529.
8 EX Hazardous area NX Non-Ex industrial version IA ATEX intrinsically safe version Ex ia IIC T6 Ga OR Special hazardous-area configuration; NICO engineering review	9 OPT... Options 00 No additional option M1 Material certificate EN 10204 Type 3.1 CN NICO in-house calibration certificate CT Third-party accredited ISO/IEC 17025 calibration certificate Additional cost SL SIL 2 capability — NICO Manufacturer Declaration Availability and applicable restrictions confirmed with quotation BF Flat mounting bracket BP 2-inch pipe-mounting bracket OR On Request / NICO engineering review Repeatable field. Controlled order: M1 → CN or CT → SL → BF or BP.		

Output. **MA** — 4...20 mA, 2-wire — Standard · **HA** — 4...20 mA, HART protocol, 2-wire — Standard · **V5** — 1...5 V, 3-wire — On Request. **V5** requires NICO engineering confirmation. Ex availability for each output shall be verified against the released Ex certificate; HART revision and configuration are confirmed at quotation stage. **Ex, SIL, output, housing, display and electrical-connection compatibility shall be verified against the released certificates and product configuration matrix.**

IA — ATEX intrinsically safe version — Ex ia IIC T6 Ga. The certificate number, complete certified marking, permitted ambient-temperature range and entity parameters are stated in the applicable valid NICO ATEX certificate, available with the quotation or on request. Output, display, housing and connection combinations selected with **IA** are verified against that certificate.

CN — NICO in-house calibration certificate: calibration performed and certificate issued by NICO in accordance with the applicable calibration, traceability and reporting procedures. It shall not be described as an accredited ISO/IEC 17025 certificate unless the applicable NICO accreditation explicitly covers the measurand and range.

CT — Third-party accredited ISO/IEC 17025 calibration certificate — additional cost. Issued by an independent laboratory accredited to ISO/IEC 17025 for the applicable measurand and pressure range.

SL — SIL 2 capability — NICO Manufacturer Declaration; availability and applicable restrictions confirmed with quotation. This is a NICO manufacturer declaration of functional-safety capability and shall not be presented as an independent third-party SIL certificate.

Option rules. **00** cannot be combined with another option. · **CN** and **CT** are mutually exclusive. · **BF** and **BP** are mutually exclusive. · **M1**, one calibration option, **SL** and one bracket option may be combined. · **OR** requires NICO engineering review. · Controlled order: **M1 → CN or CT → SL → BF or BP**.

CHAPTER 11 · DPT11 ORDERING CODE R4.4

Application selection, DP and flow examples and the required flow-sizing inputs

APPLICATION SELECTION — NOT PART OF THE MODEL CODE

APPLICATION	SELECTION GUIDANCE
Differential pressure	Direct CONN code, or M3 with an ACC54
Filter / strainer monitoring	Direct CONN code, or M3 with an ACC54
Standard DP flow assembly	M3 + ACC54 where a three-valve manifold is sufficient
Flow assembly with independent vent / test functions	M5 + ACC55
Root valves	ACC56 ×2 only when required by the selected tapping and piping arrangement
Primary flow element	OFE16 , FNE17 or VTE15 — separately sized and ordered
Closed-tank level, one remote leg	CONN = DS + DST41 arrangement H1 or L1
Closed-tank level, two remote legs	CONN = DS + DST41 arrangement R2
Special duty	OR — NICO engineering review

Manifold selection depends on isolation, equalisation, venting, testing, maintenance and project piping requirements. The primary flow element is sized and ordered independently. Neither **ACC55** nor **ACC56** is mandatory for every flow application.

ORDERING EXAMPLES — DIFFERENTIAL PRESSURE AND FLOW

Transmitter · manifold or primary element

EXAMPLE 1 — GENERAL DIFFERENTIAL PRESSURE WITH A THREE-VALVE MANIFOLD

±1 bar · factory-assembled **ACC54**

TRANSMITTER

DPT11-ST-04-M3-HA-D1-S6-AL-NX-CN

1 **ST TYPE** Standard DP transmitter 2 **04 RANGE** ±1 bar 3 **M3 CONN** DPT11 / **ACC54** assembly 4 **HA OUT** 4...20 mA, HART protocol, 2-wire
5 **D1 DISP** With display 6 **S6 MAT** SS316L HP/LP 7 **AL HSG** Aluminium 8 **NX EX** Non-Ex industrial 9 **CN OPT** NICO in-house calibration certificate

INCLUDED MANIFOLD — SEPARATELY SPECIFIED ON ITS OWN ORDER LINE

ACC54 Three-valve manifold — complete model code shall be selected from the NICO Accessories Catalogue

EXAMPLE 2 — FLOW MEASUREMENT WITH A FIVE-VALVE MANIFOLD

±1 bar · Ex ia IIC T6 Ga · pipe bracket

TRANSMITTER

DPT11-ST-04-M5-HA-D1-S6-AL-IA-CT-BP

1 **ST TYPE** Standard DP transmitter 2 **04 RANGE** ±1 bar 3 **M5 CONN** DPT11 / **ACC55** assembly 4 **HA OUT** 4...20 mA, HART protocol, 2-wire
5 **D1 DISP** With display 6 **S6 MAT** SS316L HP/LP 7 **AL HSG** Aluminium 8 **IA EX** ATEX Ex ia IIC T6 Ga
9 **CT OPT** Third-party ISO/IEC 17025 calibration 10 **BP OPT** 2-inch pipe bracket

MANIFOLD AND PRIMARY ELEMENT

ACC55 Five-valve manifold — included in the assembly package; complete model code from the NICO Accessories Catalogue

ACC56 × 2 Root valves — ordered separately, only where the tapping and piping arrangement requires them

OFE16 Orifice plate — or **FNE17** flow nozzle, or **VTE15** venturi tube — ordered separately

OFE16, **FNE17** and **VTE15** are independent primary flow elements requiring separate sizing, order codes and approved drawings. Square-root extraction shall be enabled in one location only. Where both **IA** and **SL** are required on one configuration, the combination is confirmed with the quotation.

FLOW MEASUREMENT — ENGINEERING DATA REQUIRED WITH THE ORDER

Not part of the model code

SERVICE — flow

- | | |
|---|--|
| 01 Fluid name and phase — liquid, gas or steam | 02 Flow units and range: minimum, normal, maximum |
| 03 Operating density; for gas, base and operating density | 04 Operating viscosity and compressibility |
| 05 Operating and design pressure at the element | 06 Operating and design temperature at the element |
| 07 Line nominal size, schedule and internal diameter | 08 Beta ratio and pipe material |
| 09 Upstream and downstream straight-length availability | 10 Required differential pressure at maximum flow |
| 11 Permanent pressure-loss limit, accuracy and turndown | 12 Square-root extraction location — one location only |

CHAPTER 11 · DPT11 ORDERING CODE R4.4

Sealed-level examples and required level engineering data

ORDERING EXAMPLES — CLOSED-TANK LEVEL

Transmitter · DST41 seal system

EXAMPLE 3 — CLOSED-TANK LEVEL, ONE REMOTE SEAL ON THE HP SIDE

±0.4 bar · DST41 arrangement H1

TRANSMITTER

DPT11-ST-03-DS-HA-D1-S6-AL-NX-M1-CN

- 1 **ST TYPE** Standard DP transmitter
- 2 **03 RANGE** ±0.4 bar
- 3 **DS CONN** Prepared for DST41
- 4 **HA OUT** 4...20 mA, HART protocol, 2-wire
- 5 **D1 DISP** With display
- 6 **S6 MAT** SS316L HP/LP
- 7 **AL HSG** Aluminium
- 8 **NX EX** Non-Ex industrial
- 9 **M1 OPT** EN 10204 Type 3.1
- 10 **CN OPT** NICO in-house calibration certificate

DST41 SEAL SYSTEM — ORDERED ON ITS OWN LINE

DST41-H1-SR-S6-S2-AS-F3-A1-RF-C3-E0-00 One remote capillary seal on the HP side — from the DST41 Ordering Code section

A one-leg DPT11 system uses **H1** or **L1**, never **R1**, because the arrangement code must identify which side carries the remote seal. The construction of the opposite side — direct process connection, dry leg, wet leg or impulse line — shall be stated in the engineering worksheet.

EXAMPLE 4 — CLOSED-TANK LEVEL, TWO MATCHED REMOTE SEALS

±0.4 bar · DST41 arrangement R2

TRANSMITTER

DPT11-ST-03-DS-HA-D1-S6-AL-IA-CT-BP

- 1 **ST TYPE** Standard DP transmitter
- 2 **03 RANGE** ±0.4 bar
- 3 **DS CONN** Prepared for DST41
- 4 **HA OUT** 4...20 mA, HART protocol, 2-wire
- 5 **D1 DISP** With display
- 6 **S6 MAT** SS316L HP/LP
- 7 **AL HSG** Aluminium
- 8 **IA EX** ATEX Ex ia IIC T6 Ga
- 9 **CT OPT** Third-party ISO/IEC 17025 calibration
- 10 **BP OPT** 2-inch pipe bracket

DST41 SEAL SYSTEM — ORDERED ON ITS OWN LINE

DST41-R2-SF-S6-S2-AS-F6-A1-RF-C3-E0-00 Two matched remote capillary legs — from the DST41 Ordering Code section

R2 supplies two matched legs of identical seal form, diaphragm size, diaphragm material, fill fluid, capillary construction and length. Any asymmetric construction is **OR** and requires an HP / LP engineering schedule.

SEALED LEVEL SYSTEM — ENGINEERING DATA REQUIRED WITH THE ORDER

Not part of the model code

SERVICE — closed-tank level

- | | |
|--------------------------------|--|
| 01 Process-fluid density | 02 Vapour-space pressure |
| 03 Minimum and maximum level | 04 Upper and lower tapping elevations |
| 05 Transmitter elevation | 06 Wet-leg or dry-leg condition on the opposite side |
| 07 Seal elevation on each side | 08 Capillary length on each side |
| 09 Fill fluid | 10 Process and ambient temperature |
| 11 Required LRV and URV | 12 Zero suppression or zero elevation |
| 13 Maximum static pressure | 14 Seal form, flange data and diaphragm size |

DST41 QUICK REFERENCE — DPT11

Full selection in the DST41 Ordering Code section

CODE	MEANING	CODE	MEANING	CODE	MEANING
H1	One remote seal on HP side	SF	Flush Flanged Seal	DS	DPT11 prepared for separately ordered DST41
L1	One remote seal on LP side	SR	Remote Flanged Seal		
R2	Two matched remote seals	SE	Extended Flanged Seal		

Full DST41 selection is published in the DST41 Ordering Code section. Seal arrangement, form, diaphragm material, fill fluid, flange standard, size, rating, facing, capillary and extension — together with the fill-fluid temperature reference matrix and the component-material schedule — are not repeated in this document.

CHAPTER 12 · DST41

DST41 Transmitter Diaphragm-Seal System

System architecture, arrangements and selection order

DST41 is the controlled transmitter seal system for PTH13 and DPT11.

12

DST41 — Transmitter Diaphragm-Seal System

The controlled seal system for PTH13 and DPT11 — direct-mounted and remote-capillary arrangements.

Scope. DST40 remains the general-purpose standalone diaphragm-seal family for pressure gauges, switches and conventional accessory applications.

DST41 is the transmitter diaphragm-seal system dedicated to PTH13 and DPT11. A DST41 system is ordered on its own line under the same Tag No. as the transmitter; the transmitter code carries only **CONN = DS**.

WHY A DIAPHRAGM SEAL IS USED

A diaphragm seal places a flexible metal diaphragm between the process and the transmitter. The volume between the diaphragm and the sensor is filled with a qualified fill fluid under vacuum at the factory, forming a closed hydraulic system. The process pressure deflects the diaphragm and is transmitted through the fill fluid to the sensor.

This isolates the transmitter from hot, corrosive, viscous, crystallising or solids-bearing media, allows a flanged vessel connection, and permits the transmitter to be mounted away from the process.

A sealed system is a closed, factory-filled circuit. An ordinary manifold is never placed inside it. Where process-side isolation is required it is a separate process-side accessory subject to engineering review.

SYSTEM ARCHITECTURE

ELEMENT	DETERMINES
Arrangement	Direct-mounted, one remote leg or two matched legs; and, on DPT11, which side carries the seal
Seal form	Flush, remote or extended flanged construction
Diaphragm material	The wetted diaphragm only — not every wetted component
Fill fluid	Temperature capability, density, response and vacuum limits
Flange data	Standard, nominal size, pressure rating and facing
Capillary and extension	Response time, static head, ambient influence and nozzle penetration

ARRANGEMENT BY TRANSMITTER PLATFORM

CODE	ARRANGEMENT	PTH13	DPT11
DM	Direct-mounted transmitter seal; no capillary	Standard	On Request
R1	One remote capillary leg	Standard	Not used — see H1 / L1
H1	One remote capillary seal on the HP side	—	Standard
L1	One remote capillary seal on the LP side	—	Standard
R2	Two matched remote capillary legs	—	Standard
OR	Special or asymmetric arrangement	Engineering review	Engineering review

SELECTION ORDER

How a DST41 system is specified

1 Confirm the transmitter and **CONN = DS**. **2** Select the arrangement. **3** Select the seal form against the nozzle and the service. **4** Select the diaphragm material against the process fluid. **5** Select the fill fluid against the process and ambient temperature *and* the configuration. **6** Select the flange standard, size, rating and facing against the vessel nozzle drawing. **7** Select the capillary length and the extension. **8** Supply the enquiry checklist on page 32. The complete code is built in the Ordering Code section that follows.

CHAPTER 13 · DST41 ORDERING CODE R0

Scope, product code, arrangement, seal forms and enquiry checklist · NICO-OC-DST41-R0

SCOPE

DST40 remains the general-purpose standalone diaphragm-seal family for pressure gauges, switches and conventional accessory applications. **DST41** is the transmitter diaphragm-seal system dedicated to PTH13 and DPT11. A DST41 system is ordered on its own line under the same tag number as the transmitter; the transmitter code carries only **CONN = DS**.

PRODUCT CODE

Select one option in each field and combine them in sequence

DST41	1 ARR Mounting	2 FORM Seal form	3 DMAT Diaphragm	4 FILL Fill fluid	5 FST Flange std	6 FSZ Flange size	7 RAT Rating	8 FCE Facing	9 CAP Capillary	10 EXT Extension	11 OPT Option
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CODE CONVENTIONS — every selectable value is exactly two characters. **00** none / no additional option · **OR** On Request — the configuration is defined by NICO engineering and confirmed with the quotation. Combine one value from each field in the printed sequence.

FIELD 1 — ARR · ARRANGEMENT

CODE	ARRANGEMENT	APPLIES TO
DM	Direct-mounted transmitter seal; no capillary	PTH13 standard; DPT11 OR
R1	One remote capillary leg	PTH13
H1	One remote capillary seal on the HP side	DPT11
L1	One remote capillary seal on the LP side	DPT11
R2	Two matched remote capillary legs	DPT11
OR	Special or asymmetric arrangement	Engineering review

One-leg DPT11 systems use H1 or L1, never R1, because R1 does not identify which side carries the remote seal. With **H1** or **L1** the condition of the opposite side shall be stated in the engineering worksheet: direct process connection, dry leg, wet leg, impulse line or other approved arrangement. **R2** normally requires identical seal form, diaphragm size, diaphragm material, fill fluid, capillary construction and capillary length on both sides; any asymmetric construction is **OR** and requires an HP / LP engineering schedule. Direct-mounted DST41 on DPT11 remains **OR** until a released NICO mechanical drawing confirms the configuration.

FIELD 2 — FORM · SEAL FORM

Three standard forms · other constructions are OR

SF Flush Flanged Seal DST41-SF  Diaphragm approximately flush with the process-facing flange surface. Selected for larger flanged connections and where process cavities are to be minimised. Reference minimum size ≈ 2 in / DN50 · normal flange sizes F5 · F6 · F7 Reference guidance — the applicable limit is confirmed with the quotation	SR Remote Flanged Seal DST41-SR  Compact flanged seal with capillary connection, selected for smaller flange sizes subject to NICO diaphragm and sensitivity validation. Reference minimum size $\approx \frac{1}{2}$ in / DN15 · normal flange sizes F1 · F2 · F3 · F4 Reference guidance — the applicable limit is confirmed with the quotation	SE Extended Flanged Seal DST41-SE  Diaphragm carried forward into the vessel nozzle on an extension, reducing dead volume and isolating the seal from problematic nozzle geometry. Reference minimum size $\approx 1\frac{1}{2}$ in / DN40 · normal flange sizes F4 · F5 · F6 · F7 Reference guidance — the applicable limit is confirmed with the quotation
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OR — DST41-OR special form. Threaded, sanitary, in-line, cone-and-thread and any customer-specific flanged geometry outside SF, SR and SE are handled as **OR** under NICO engineering review and remain limited to NICO-supported flange systems. The three standard forms follow the functional concept of the Rosemount 1199 FFW, RFW and EFW designs as an architecture reference only; no Rosemount model number, rating or certification applies to a NICO product.

CUSTOMER ENQUIRY CHECKLIST

Engineering data required with the enquiry — not part of the ordering code

01 Tag number and transmitter model	02 Service: pressure or level	03 Process fluid and phase
04 Fluid density	05 Operating / design pressure	06 Operating / design temperature
07 Ambient-temperature range	08 Vacuum condition	09 Vessel or nozzle drawing
10 Flange standard, size, rating and facing	11 Mounting elevation	12 Required arrangement
13 HP / LP side for one-leg DPT11 systems	14 Capillary length	15 Required response time
16 Wetted-material and corrosion requirements	17 NACE requirement	18 Oxygen-cleaning requirement
19 Steam-out, cleaning or sterilisation condition	20 Required LRV and URV	21 Zero suppression or elevation

CHAPTER 13 · DST41 ORDERING CODE R0

Diaphragm material, component schedule, fill fluid, flange standard, size and rating

FIELD 3 — DMAT · DIAPHRAGM MATERIAL

CODE	DIAPHRAGM MATERIAL
S6	SS316L
HC	Hastelloy C-276
MO	Monel 400
TI	Titanium
TA	Tantalum
PT	PTFE-coated SS316L diaphragm only
OR	On Request / NICO engineering review

PT means only a PTFE-coated SS316L diaphragm. It never means a PTFE flange, body, extension, upper housing or other pressure-retaining component. **MO** is Monel 400 per the NICO material dictionary. The code font prints a slashed zero, so the letter O in **MO** can never be read as a zero; a zero-based variant of this code is prohibited.

COMPONENT	DEFINED BY	STATUS
Diaphragm	DMAT code	Selected
Wetted lower body	Released NICO drawing	Confirmed with quotation
Extension	Released NICO drawing	Confirmed with quotation
Gasket surface	Released NICO drawing	Confirmed with quotation
Upper housing	Released NICO drawing	Confirmed with quotation
Mounting flange	Released NICO drawing	Confirmed with quotation
Gasket	Released NICO drawing	Confirmed with quotation
Capillary wetted parts	Released NICO drawing	Confirmed with quotation
Capillary armour / protection	Released NICO drawing	Confirmed with quotation

The diaphragm code does not define every wetted component. The component material schedule for the selected system is stated on the applicable NICO drawing and confirmed with the quotation.

FIELD 4 — FILL · FILL FLUID

Temperature reference depends on the configuration, not on the fluid alone

CODE	FILL FLUID	DIRECT / NO EXTENSION	50 MM EXTENSION	100 MM EXTENSION	REMOTE-CAPILLARY REFERENCE	SPECIFIC GRAVITY AT 25 °C
S2	Silicone 200	−45 ... +205 °C	NICO confirmation	NICO confirmation	−45 ... +205 °C	≈ 0.934
T3	Tri-Therm 300	−40 ... +205 °C	−40 ... +240 °C	−40 ... +300 °C	−40 ... +300 °C	≈ 0.795
S4	Silicone 704	0 ... +205 °C	0 ... +240 °C	0 ... +300 °C	0 ... +315 °C	≈ 1.07
S5	Silicone 705	+20 ... +205 °C	+20 ... +240 °C	+20 ... +300 °C	+20 ... +370 °C	≈ 1.09
OR	Other fluid / special service	NICO engineering review				

These values are **Rosemount 1199 reference benchmarks, not released NICO performance limits**. Final NICO limits depend on the actual qualified fill fluid, filling procedure, seal form, diaphragm size, capillary inside diameter and length, extension, process pressure, vacuum, ambient temperature and transmitter thermal exposure. · None of the four standard fluids is automatically approved for **oxygen service**; oxygen service shall use **OR** and requires an approved fluid, oxygen-clean construction and NICO engineering approval. · Vacuum service requires vapour-pressure and filling-system review. · The complete assembly is limited by its most restrictive component. · Food-grade suitability shall not be claimed without supplier certification and NICO approval.

FIELDS 5, 6 AND 7 — FLANGE STANDARD, SIZE AND RATING

CODE	FLANGE STANDARD
AS	ASME B16.5
DI	Applicable DIN / EN flange standard confirmed by NICO drawing
OR	Special standard; engineering review

DN is reserved for nominal-diameter notation and is never used as a flange-standard code. JIS, GOST, HG and sanitary standards are not offered.

CODE	ASME SIZE	DIN / EN REFERENCE
F1	½ in	DN15
F2	¾ in	DN20
F3	1 in	DN25
F4	1½ in	DN40
F5	2 in	DN50
F6	3 in	DN80
F7	4 in	DN100

Availability confirmed with the quotation — the applicable flange size is availability until supported by a drawing.

CODE	ASME RATING	DIN / EN RATING
A1	Class 150	—
A3	Class 300	—
A6	Class 600	—
D1	—	PN16
D4	—	PN40
D6	—	PN63
DA	—	PN100
OR	—	Special rating

Availability confirmed with the quotation — ratings are published where supported by a NICO drawing; all others are confirmed with the quotation.

CHAPTER 13 · DST41 ORDERING CODE R0 Facing, capillary, extension and ordering examples

FIELDS 8, 9 AND 10 — FACING, CAPILLARY AND EXTENSION

CODE	FACING	CODE	CAPILLARY LENGTH	CODE	EXTENSION
RF	Raised face	C0	No capillary; direct-mounted arrangement	E0	No extension
FF	Flat face	C1	1 m	E2	50 mm / 2 in extension
OR	Special facing; engineering review	C2	2 m	E4	100 mm / 4 in extension
RTJ is not published as a standard facing until NICO holds a released ring-joint seal drawing and pressure-test basis; until then it is OR.		C3	3 m	OR	Special extension; engineering review
		C5	5 m	SE requires an approved extension selection. SF and SR use only extension selections supported by NICO drawings.	
		CA	10 m		
		OR	Custom length; engineering review		

Capillary rules. DM requires C0; R1, H1, L1 and R2 cannot use C0. Capillary length affects response time, static-head correction, ambient influence and zero shift; select the shortest practical capillary. · Field 11 — OPT: 00 no additional option · OR On Request.

Effective diaphragm size and capillary protection are not public code fields. The effective diaphragm size is determined by NICO engineering from the seal form, flange size, measured pressure range, capillary selection and required response time. The standard remote capillary is a stainless-steel capillary in a flexible protective armour; any special coating or additional protection is selected as OR until NICO releases specific constructions.

ORDERING EXAMPLES

Decoded in the printed field sequence

Example configuration — final availability confirmed with the quotation — every example below carries this status. No example contains OR in a mandatory field.

EXAMPLE 1 — PTH13 DIRECT-MOUNTED SEAL		Arrangement DM · no capillary
DST41 SEAL SYSTEM		
DST41-DM-SF-S6-S2-AS-F5-A1-RF-C0-E0-00		
1 DM ARR Direct-mounted; no capillary	2 SF FORM Flush flanged seal	3 S6 DMAT SS316L diaphragm
4 S2 FILL Silicone 200	5 AS FST ASME B16.5	6 F5 FSZ 2 in / DN50
7 A1 RAT Class 150	8 RF FCE Raised face	9 C0 CAP No capillary
10 E0 EXT No extension	11 00 OPT No additional option	
EXAMPLE 2 — PTH13 OPEN-TANK REMOTE SEAL		Arrangement R1 · 3 m capillary
DST41 SEAL SYSTEM		
DST41-R1-SE-S6-S2-AS-F6-A1-RF-C3-E2-00		
1 R1 ARR One remote leg — PTH13	2 SE FORM Extended flanged seal	3 S6 DMAT SS316L diaphragm
4 S2 FILL Silicone 200	5 AS FST ASME B16.5	6 F6 FSZ 3 in / DN80
7 A1 RAT Class 150	8 RF FCE Raised face	9 C3 CAP 3 m capillary
10 E2 EXT 50 mm / 2 in extension	11 00 OPT No additional option	
EXAMPLE 3 — DPT11 HP-SIDE REMOTE SEAL		Arrangement H1 · 3 m capillary
DST41 SEAL SYSTEM		
DST41-H1-SR-S6-S2-AS-F3-A1-RF-C3-E0-00		
1 H1 ARR One remote seal, HP side	2 SR FORM Remote flanged seal	3 S6 DMAT SS316L diaphragm
4 S2 FILL Silicone 200	5 AS FST ASME B16.5	6 F3 FSZ 1 in / DN25
7 A1 RAT Class 150	8 RF FCE Raised face	9 C3 CAP 3 m capillary
10 E0 EXT No extension	11 00 OPT No additional option	
EXAMPLE 4 — DPT11 LP-SIDE REMOTE SEAL		Arrangement L1 · 3 m capillary
DST41 SEAL SYSTEM		
DST41-L1-SR-S6-S2-AS-F3-A1-RF-C3-E0-00		
1 L1 ARR One remote seal, LP side	2 SR FORM Remote flanged seal	3 S6 DMAT SS316L diaphragm
4 S2 FILL Silicone 200	5 AS FST ASME B16.5	6 F3 FSZ 1 in / DN25
7 A1 RAT Class 150	8 RF FCE Raised face	9 C3 CAP 3 m capillary
10 E0 EXT No extension	11 00 OPT No additional option	
EXAMPLE 5 — DPT11 TWO MATCHED REMOTE SEALS		Arrangement R2 · 3 m capillary
DST41 SEAL SYSTEM		
DST41-R2-SF-S6-S2-AS-F6-A1-RF-C3-E0-00		
1 R2 ARR Two matched remote legs	2 SF FORM Flush flanged seal	3 S6 DMAT SS316L diaphragm
4 S2 FILL Silicone 200	5 AS FST ASME B16.5	6 F6 FSZ 3 in / DN80
7 A1 RAT Class 150	8 RF FCE Raised face	9 C3 CAP 3 m capillary
10 E0 EXT No extension	11 00 OPT No additional option	

CHAPTER 14 · LINKED EQUIPMENT

Manifold and Linked-Equipment Selection

ACC53, ACC54, ACC55 and ACC56 — and how each is linked to the transmitter

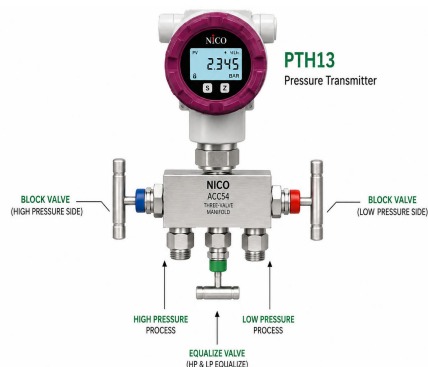
Every linked item is a separate product with its own model code, under one Tag No.

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NICO manifold and linked-equipment selection

The manifold makes a pressure or differential-pressure measurement operable, verifiable and maintainable.

FIGURE 10



PTH13 + ACC53 — two-valve. One block valve isolates the transmitter from the process; one bleed / vent valve relieves and provides the calibration connection. Selected by **CONN = M2**.

FIGURE 8



ACC54 — three-valve. Two block valves plus one equalise valve. Selected by **CONN = M3** on DPT11, and on PTH13 subject to the approved mechanical interface.

FIGURE 9



DPT11 + ACC55 — five-valve. Two block plus one equalise plus two independent vent / test valves. Selected by **CONN = M5**.

MANIFOLD FAMILIES

MODEL	FAMILY	VALVE CONFIGURATION	CONN	USED WITH
ACC53	Two-valve manifold	One block plus one bleed / vent	M2	PTH13
ACC54	Three-valve manifold	Two block plus one equalize	M3	PTH13 and DPT11 — subject to the approved mechanical interface
ACC55	Five-valve manifold	Two block plus one equalize plus two vent / test valves	M5	DPT11
ACC56	Root valve	Primary isolation at the process tapping	Separate line	PTH13 · DPT11

M3 on PTH13. The applicable ACC54 body and mounting variant for a PTH13 assembly is confirmed with the quotation. ACC54 is not automatically compatible with PTH13 in every body and mounting variant.

The **PTH13 / DPT11 mother code identifies the transmitter configuration and the required assembly interface.** The detailed manifold construction remains defined by the separately specified **ACC53, ACC54 or ACC55** model code, selected from the NICO Accessories Catalogue and written on its own order line under the same Tag No. **M2, M3** and **M5** are not port spacings or thread sizes.

Factory-assembled package. With **M2, M3** or **M5** the transmitter is supplied assembled on the manifold: mechanical assembly, correct valve orientation, thread and seal preparation, torque control, leak or pressure test as applicable, final inspection and common identification under the same Tag No.

LINKED EQUIPMENT — ONE TAG NO., SEPARATE ORDER LINES

MODEL	ITEM	RELATIONSHIP TO THE TRANSMITTER
DST41	Transmitter diaphragm-seal system	Selected by CONN = DS; own model code on its own order line
ACC53	Two-valve manifold	Included in the M2 assembly package; own model code
ACC54	Three-valve manifold	Included in the PTH13 M3 or DPT11 M3 assembly package; own model code
ACC55	Five-valve manifold	Included in the M5 assembly package; own model code
ACC56	Root valve	Ordered separately, only where the tapping and piping arrangement requires it
OFE16	Orifice plate	Independent primary element — separately sized and ordered
FNE17	Flow nozzle	Independent primary element — separately sized and ordered
VTE15	Classical venturi tube	Independent primary element — separately sized and ordered

Complete **ACC53 / ACC54 / ACC55** model codes shall be selected from the NICO Accessories Catalogue. Dimensions, pressure and temperature ratings, materials and ordering data for all manifolds and valves are published there.

CHAPTER 15 · FLOW MEASUREMENT

Differential-Pressure Flow Measurement

The measurement principle, the square-root relationship and the complete assembly

The transmitter, manifold, root valves and primary element are linked under one Tag No. but remain separate order lines.

15 Differential-pressure flow measurement

The DPT11 measures the differential pressure developed across a primary flow element sized to the ISO 5167 series.

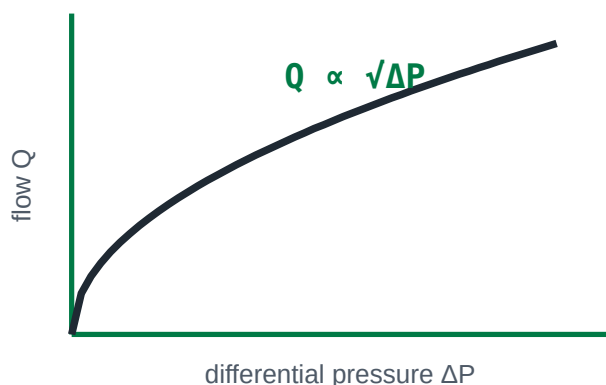
A primary flow element creates a local restriction in the pipe. The fluid accelerates through the restriction, and by conservation of energy its static pressure falls. The difference between the static pressure upstream and the static pressure at or downstream of the restriction is proportional to the square of the volumetric flow rate.

The DPT11 measures that differential. The **HP** connection is taken **upstream** of the element and the **LP** connection at or **downstream** of it.

$$Q \propto \sqrt{\Delta P}$$

Flow is proportional to the square root of the differential pressure. The full relationship, including the discharge coefficient, expansibility factor, beta ratio and pipe diameter, is given in the ISO 5167 series.

FIGURE 12

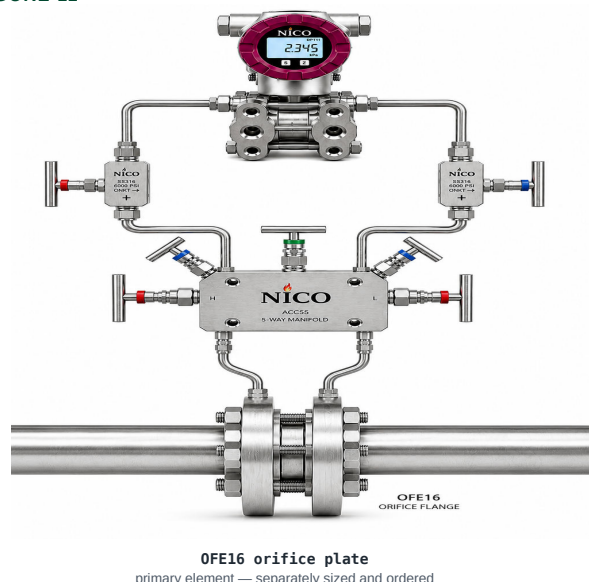


The square-root relationship. At low flow a small change in flow produces a very small change in differential pressure, which is why the usable turndown of a differential-pressure flow measurement is limited and why the primary element must be sized for the required flow range.

Square-root extraction shall be enabled in one location only. The conversion from differential pressure to flow may be performed in the transmitter or in the host system — never in both. Double extraction produces a fourth-root characteristic and a grossly incorrect flow indication at every point except full scale. Record the chosen extraction location on the instrument datasheet and in the loop documentation.

The primary element is a separate component. An orifice plate, flow nozzle or venturi tube is an independent primary element sized to the ISO 5167 series per the project specification. It is not part of the DPT11 transmitter body. With the root valves, impulse lines and manifold it forms the flow-measurement assembly. The DPT11 range selection follows the primary-element sizing calculation — never the other way round.

FIGURE 11



OFE16 orifice plate
primary element — separately sized and ordered

Complete differential-pressure flow assembly. HP is taken from the upstream tapping and LP from the downstream tapping. Root valves provide primary isolation at the tapplings; the impulse lines carry the pressures to the manifold; the manifold provides isolation and equalisation; the DPT11 measures the differential. Each item is a separate order line under one Tag No.

CHAPTER 15 · FLOW MEASUREMENT

The Complete DPT11 Flow Assembly

Components, manifold selection and installation principles

Neither ACC55 nor ACC56 is mandatory for every flow application.

THE COMPLETE DPT11 FLOW ASSEMBLY

Components, roles and supply

COMPONENT	MODEL	ROLE	SUPPLY AND ORDERING
Primary flow element	OFE16 · FNE17 · VTE15	Generates the differential pressure proportional to flow	Independent product, sized to ISO 5167 per project specification; separate order line
Root valves	ACC56	Primary isolation at the process tapplings	Ordered separately, only where the tapping and piping arrangement requires them
Impulse lines	—	Connect the tapplings to the manifold	Project or installation scope
Manifold	ACC54 · ACC55	Block, equalise and — with ACC55 — vent and test	Included in the M3 or M5 assembly package; own complete model code
Transmitter	DPT11	Measures the differential pressure	NICO — the mother code identifies the assembly interface

MANIFOLD SELECTION FOR FLOW DUTY

REQUIREMENT	SELECTION GUIDANCE
Standard DP flow assembly	M3 + ACC54 where a three-valve manifold is sufficient
Flow assembly with independent vent / test functions	M5 + ACC55
Root valves	ACC56 ×2 only when required by the selected tapping and piping arrangement
Primary flow element	OFE16, FNE17 or VTE15 — separately sized and ordered

Manifold selection depends on isolation, equalisation, venting, testing, maintenance and project piping requirements. The primary flow element is sized and ordered independently. Neither ACC55 nor ACC56 is mandatory for every flow application.

INSTALLATION PRINCIPLES

Applies to every DP flow point

Tapping orientation

Liquid — tapplings at or below the horizontal centreline so the impulse lines stay full. Gas — tapplings above the centreline so condensate drains back. Steam — horizontal tapplings with condensate pots at equal height on both legs.

Impulse-line symmetry

Both legs should follow the same route, the same length and the same thermal environment. Asymmetric legs produce a differential head that appears as a false flow.

Slope and venting

Slope the impulse lines continuously toward or away from the transmitter as the service requires, with no local high or low points that can trap gas or condensate.

Straight lengths

The upstream and downstream straight lengths required by the ISO 5167 series shall be confirmed against the piping arrangement before the element is sized.

Zero verification

Equalise through the manifold and verify the zero after installation and after any impulse-line intervention.

Extraction location

Record whether square-root extraction is enabled in the transmitter or in the host — one location only.

CHAPTER 15 · PRIMARY FLOW ELEMENTS

NICO Primary Flow Elements

Family framework and comparison structure

Detailed specifications, sizing calculations and Ordering Codes are published in the separate NICO Differential-Pressure Primary Flow Elements Catalogue.

NICO DIFFERENTIAL-PRESSURE PRIMARY FLOW ELEMENTS

Family framework

Detailed data is published in the NICO Differential-Pressure Primary Flow Elements Catalogue

This chapter publishes the family framework, the comparison structure and the sizing-data requirements. **Detailed specifications, sizing calculations and Ordering Codes for OFE16, FNE17 and VTE15 are published in the separate NICO Differential-Pressure Primary Flow Elements Catalogue.**

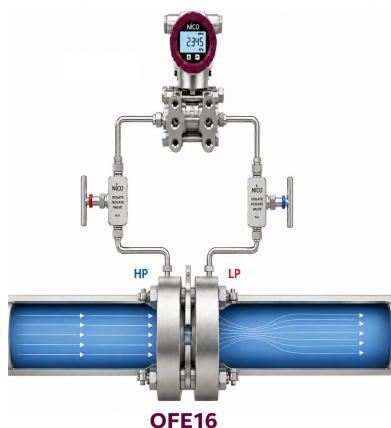
A primary flow element is the component that generates the differential pressure measured by the DPT11. NICO identifies three element families. Each is an independent product, sized to the ISO 5167 series for the specific service, and ordered on its own line under the same Tag No. as the transmitter.

FAMILY COMPARISON FRAMEWORK

Character and typical use — engineering guidance only

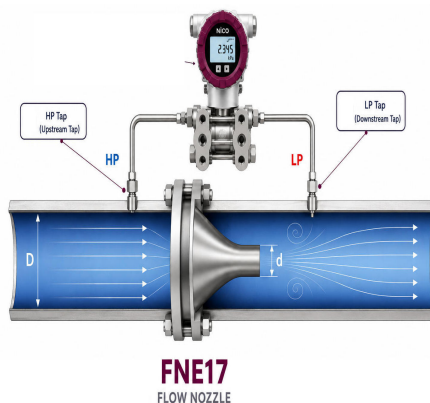
MODEL	ELEMENT	CHARACTER	TYPICAL USE
OFE16	Orifice plate	Simple, economical and the most widely standardised element; the highest permanent pressure loss of the three	General liquid, gas and steam flow
FNE17	Flow nozzle	Robust at high velocity; lower permanent loss than an orifice plate for the same beta ratio	Steam and high-velocity service
VTE15	Classical venturi tube	The lowest permanent pressure loss; the longest installed length and the highest cost	Large lines and energy-sensitive service

FIGURE 13



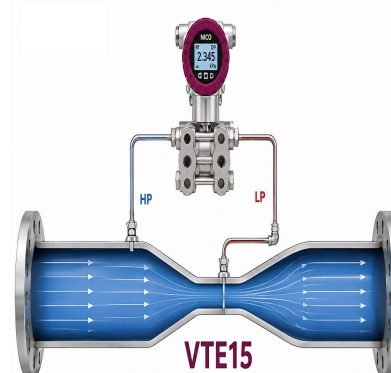
OFE16 orifice plate. A sharp-edged concentric plate clamped between flanges. The tappings are placed per the arrangement selected from the ISO 5167-2 options.

FIGURE 14



FNE17 flow nozzle. A curved convergent inlet leading into a cylindrical throat, per ISO 5167-3. More robust at high velocity than a plate.

FIGURE 15



VTE15 classical venturi tube. A convergent cone, a cylindrical throat with the LP tapping, and a long divergent cone that recovers most of the pressure, per ISO 5167-4.

The three schematics above are simplified longitudinal sections showing the working principle and the tapping positions only. They are not to scale and carry no NICO dimension, bore, throat diameter, beta ratio or tapping-spacing value.

Beta ratios, discharge coefficients, expansibility factors, permanent-pressure-loss values, uncertainty, straight-length requirements, materials, flange ratings, dimensions and Ordering Code values for OFE16, FNE17 and VTE15 are published in the separate NICO Differential-Pressure Primary Flow Elements Catalogue. The qualitative statements above are general engineering characteristics of the element types as defined in the ISO 5167 series.

WHERE THE FLOW-ELEMENT DATA IS PUBLISHED

Detailed specifications, sizing calculations and Ordering Codes are published in the separate NICO Differential-Pressure Primary Flow Elements Catalogue. Until that catalogue is released, no selectable OFE16, FNE17 or VTE15 ordering code is available. The element for a specific service is sized and quoted by NICO engineering against the project specification and the sizing data on the next page.

What is selectable from this catalogue. The **DPT11** transmitter, the **ACC54** or **ACC55** manifold assembly and the **ACC56** root valves are selectable now. The primary flow element is specified through the sizing-data checklist on the next page and quoted by NICO engineering against the project specification.

CHAPTER 15 · PRIMARY FLOW ELEMENTS

Sizing Data and ISO 5167 Framework

Required sizing data, the standard basis and the inspection framework

The sizing data below is required whichever element family is finally selected.

REQUIRED SIZING DATA

Supplied with the enquiry for every DP flow point

- | | |
|---|--|
| 01 Tag number and service description | 02 Fluid name and phase — liquid, gas or steam |
| 03 Flow units and range: minimum, normal and maximum | 04 Operating density; for gas, base and operating density |
| 05 Operating viscosity | 06 Compressibility or isentropic exponent for gas |
| 07 Operating and design pressure at the element | 08 Operating and design temperature at the element |
| 09 Line nominal size, schedule and internal diameter | 10 Pipe material and internal roughness |
| 11 Upstream and downstream straight-length availability | 12 Upstream fitting type — bend, tee, valve, reducer |
| 13 Required differential pressure at maximum flow | 14 Permanent pressure-loss limit |
| 15 Required uncertainty and turndown | 16 Tapping type and orientation required by the specification |
| 17 Element material and corrosion requirements | 18 Flange standard, size, rating and facing of the line |
| 19 Applicable project specification and standard edition | 20 Square-root extraction location — one location only |

ISO 5167 ENGINEERING FRAMEWORK

The sizing and design basis

PART	SUBJECT	ROLE IN A NICO FLOW ASSEMBLY
ISO 5167-1	General principles and requirements	Defines the method, the installation requirements and the uncertainty framework applied to every element
ISO 5167-2	Orifice plates	Sizing and geometry basis for the OFE16 family
ISO 5167-3	Nozzles and venturi nozzles	Sizing and geometry basis for the FNE17 family
ISO 5167-4	Venturi tubes	Sizing and geometry basis for the VTE15 family

Citing the ISO 5167 series as the design and sizing basis is a statement of engineering methodology. It is **not** a claim of certified compliance for any NICO element. Compliance is stated only when the corresponding NICO calculation, drawing, inspection and test records have been issued for the specific element.

CALCULATION, INSPECTION AND TEST FRAMEWORK

Applied when the element data is released

Sizing calculation

Bore or throat diameter, beta ratio, discharge coefficient, expansibility factor and the resulting differential at maximum flow — calculated per the applicable ISO 5167 part and issued as a calculation sheet.

Dimensional inspection

Bore or throat diameter, edge condition, flatness, surface finish, concentricity and plate thickness against the released drawing.

Material verification

Material identification and EN 10204 Type 3.1 certification of the element and its pressure-retaining parts.

Pressure test

Hydrostatic test of the assembly where the design and the project specification require it.

Marking

Tag number, bore or throat diameter, material, flow direction and line size on the element tab or body.

Documentation

Sizing calculation, drawing, material certificate, inspection report and, where applicable, the pressure-test report.

Detailed data is published in the NICO Differential-Pressure Primary Flow Elements Catalogue

CHAPTER 16 · REFERENCE

Engineering Data Required with an Enquiry

Consolidated enquiry checklists for pressure, sealed, level and flow systems

None of these values is part of an ordering code.

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Engineering data required with an enquiry

The data below is not part of any model code. It is what NICO needs in order to confirm a selection, calculate a sealed system and issue a datasheet.

EVERY ENQUIRY

- 01 Tag number and service description
- 02 Transmitter platform and application
- 03 Process fluid, phase and cleanliness
- 04 Operating, design and maximum pressure
- 05 Operating and design temperature
- 06 Ambient-temperature range
- 07 Required measuring range, LRV and URV
- 08 Required accuracy and turndown
- 09 Wetted-material and corrosion requirements
- 10 NACE requirement
- 11 Hazardous-area zone, gas group and required marking
- 12 Electrical connection and cable entry
- 13 Output and display requirement
- 14 Mounting arrangement and bracket requirement
- 15 Certification and documentation requirement

SEALED SYSTEMS — DST41

- 01 Service: pressure or level
- 02 Fluid density
- 03 Vacuum condition
- 04 Vessel or nozzle drawing
- 05 Flange standard, size, rating and facing
- 06 Mounting elevation of each seal
- 07 Required arrangement — DM, R1, H1, L1 or R2
- 08 HP / LP side for one-leg DPT11 systems
- 09 Construction of the opposite side
- 10 Capillary length per leg
- 11 Required response time
- 12 Oxygen-cleaning requirement
- 13 Steam-out, cleaning or sterilisation condition
- 14 Zero suppression or elevation

LEVEL SYSTEMS

- 01 Process-fluid density and its variation
- 02 Vapour-space pressure and condition
- 03 Minimum and maximum level
- 04 Upper and lower tapping elevations
- 05 Transmitter elevation
- 06 Wet-leg or dry-leg condition

FLOW SYSTEMS

In addition to the sizing data on page 32

- | | | |
|---|--|---|
| 01 Primary element type required by the specification | 02 Line nominal size, schedule and internal diameter | 03 Upstream and downstream straight-length availability |
| 04 Required differential pressure at maximum flow | 05 Permanent pressure-loss limit | 06 Square-root extraction location — one location only |

Applications are recorded on the datasheet, never in the model code. Level, flow and filter monitoring are applications of a pressure or differential-pressure transmitter. No **LEVEL**, **FLOW**, **FILT** or other service field exists in the PTH13, DPT11 or DST41 code, and none shall be added.

CHAPTER 17 · REFERENCE

Standards and Testing

Standard roles in design, testing and certification

A standard listed as a design reference or test method is not a claim of certified compliance.

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Standards, testing, calibration and available documentation

Each standard is classified by its role — design reference, test method, verified compliance or certification. Listing a standard is not by itself a claim of certified compliance.

STANDARD	SUBJECT	ROLE IN THIS PROGRAMME	STATUS
IEC 60770 series	Transmitters for industrial process control	Test method — accuracy and performance evaluation	Qualification in progress
IEC 61298 series	Process measurement devices — test methods	Test method — general performance evaluation	Qualification in progress
IEC 60529	Degrees of protection (IP code)	Test method — enclosure protection classification	PTH13 and DPT11 – IP65 confirmed
EN 61518	Mating dimensions of DP transmitters and manifolds	Design reference — DPT11 manifold mating dimensions	Design interface
ASME B16.5	Pipe flanges and flanged fittings	Design reference — DST41 flanged connections, code FST = AS	Per the DST41 programme
EN 1092-1	Steel flanges	Design reference — DST41 DIN / EN flanged connections, code FST = DI	Per the DST41 programme
ASME B1.20.1	Pipe threads, general purpose (inch)	Design reference — NPT connections N4 and N2	Design interface
ISO 228-1	Pipe threads, non-sealing (G)	Design reference — G connections G4 and G2	Design interface
ISO 261	ISO general purpose metric screw threads	Design reference — M20 × 1.5 connection MT	Design interface
ISO 5167 series	Flow measurement by pressure-differential devices	Design reference — sizing basis of primary flow elements	Applied per project; see the Primary Flow Elements Catalogue
ISO/IEC 17025	Competence of testing and calibration laboratories	Reference for calibration options CN and CT	See the calibration table
IEC 61508	Functional safety of E/E/PE safety-related systems	Basis of the SIL 2 capability declaration, option SL	NICO Manufacturer Declaration — confirmed with quotation
IEC 60079 series	Explosive atmospheres	Certification basis — intrinsically safe versions, code IA	See the certification table below

Compliance with a test-method standard is stated only when the corresponding qualification report has been issued. Verified-compliance entries are added to this page as reports are released.

HAZARDOUS-AREA CERTIFICATION STATUS BY PRODUCT

PRODUCT	VERSION	CERTIFICATION STATUS
PTH13	EX = IA — ATEX intrinsically safe version, certified marking Ex ia IIC T6 Ga	Valid and released. Certificate number and complete certified marking reproduced below, exactly as issued.
DPT11	EX = IA — ATEX intrinsically safe version, certified marking Ex ia IIC T6 Ga	Valid and released. Certificate number and complete certified marking reproduced below, exactly as issued.
PTP30	No hazardous-area version	No PTP30 hazardous-area certificate exists in the controlled source. A hazardous-area requirement is handled as OR.

CHAPTER 17 · REFERENCE

Certification, Calibration and Documentation

Certified ATEX marking, calibration certificates and available documentation

The certified marking is reproduced from the applicable valid NICO ATEX certificate.

CERTIFIED ATEX MARKING

Reproduced exactly from the valid NICO ATEX certificate

CERTIFICATE FIELD	VALUE
Protection concept	Ex ia – intrinsic safety
Certified marking	Ex ia IIC T6 Ga
Gas group	IIC
Temperature class	T6
Equipment protection level	Ga
Enclosure protection	IP65 according to IEC 60529

The certification is valid and released for the PTH13 and DPT11 intrinsically safe versions. The certified marking **Ex ia IIC T6 Ga** is reproduced above without alteration or abbreviation. Certificate number, complete marking, permitted ambient range and entity parameters are stated in the applicable valid NICO ATEX certificate, available with the quotation or on request.

Certified data. Ex markings, certificate numbers, entity parameters (Ui, Ii, Pi, Ci, Li) and permitted ambient ranges are taken exclusively from the approved certificate of each product — never as a blanket claim across the family. Nothing shall be estimated or fabricated. For hazardous-area applications always request the product certificate with the quotation and verify the marking against the required zone and gas group. Output, display, housing and connection combinations selected with **IA** shall be verified against that certificate.

CALIBRATION AND DOCUMENTATION AVAILABLE WITH THE ORDER

OPTION	DOCUMENT	BASIS
M1	Material certificate EN 10204 Type 3.1	Issued for the specified wetted materials.
CN	NICO in-house calibration certificate	Calibration performed and certificate issued by NICO in accordance with the applicable calibration, traceability and reporting procedures. It shall not be described as an accredited ISO/IEC 17025 certificate unless the applicable NICO accreditation explicitly covers the measurand and range.
CT	Third-party accredited ISO/IEC 17025 calibration certificate — additional cost	Issued by an independent laboratory accredited to ISO/IEC 17025 for the applicable measurand and pressure range. Additional cost applies.
SL	SIL 2 capability — NICO Manufacturer Declaration; availability and applicable restrictions confirmed with quotation	This is a NICO manufacturer declaration of functional-safety capability and shall not be presented as an independent third-party SIL certificate.

CHAPTER 18 · REFERENCE

Final Ordering Examples

PTH13 — direct, assembled and sealed

One transmitter mother code plus all required linked-equipment order lines under the same Tag No.

18

Final ordering examples and selection summary

Each example is written as it appears on the order: one Tag No., one line per product. Every code is verified field by field against the approved Ordering Code sections.

EXAMPLE 1 — DIRECT PROCESS PRESSURE

PTH13 · gauge 0...1 bar · silicon · ½ NPT

TRANSMITTER

PTH13-GP-SI-04-N2-HA-D1-S6-AL-NX-CN

- 1 **GP TYPE** Gauge pressure
- 2 **SI SENS** Silicon sensor
- 3 **04 RANGE** 0...1 bar
- 4 **N2 CONN** ½ NPT direct
- 5 **HA OUT** 4...20 mA, HART protocol, 2-wire
- 6 **D1 DISP** With display
- 7 **S6 MAT** SS316L
- 8 **AL HSG** Aluminium
- 9 **NX EX** Non-Ex industrial
- 10 **CN OPT** NICO in-house calibration certificate

EXAMPLE 2 — PRESSURE POINT WITH AN ASSEMBLED TWO-VALVE MANIFOLD

PTH13 · ACC53 assembly package

TRANSMITTER ASSEMBLY

PTH13-GP-SI-04-M2-HA-D1-S6-AL-NX-M1-CN

- 1 **GP TYPE** Gauge pressure
- 2 **SI SENS** Silicon sensor
- 3 **04 RANGE** 0...1 bar
- 4 **M2 CONN** PTH13 / ACC53 assembly
- 5 **HA OUT** 4...20 mA, HART protocol, 2-wire
- 6 **D1 DISP** With display
- 7 **S6 MAT** SS316L
- 8 **AL HSG** Aluminium
- 9 **NX EX** Non-Ex industrial
- 10 **M1 OPT** EN 10204 Type 3.1
- 11 **CN OPT** NICO in-house calibration certificate

INCLUDED MANIFOLD — SEPARATELY SPECIFIED

ACC53 — complete model code selected from the NICO Accessories Catalogue

Factory-assembled package. The manifold is specified by its complete ACC53 ordering code and written on its own order line under the same Tag No.

EXAMPLE 3 — PRESSURE POINT WITH AN ASSEMBLED THREE-VALVE MANIFOLD

PTH13 · ACC54 assembly package

TRANSMITTER ASSEMBLY

PTH13-GP-SI-06-M3-HA-D1-S6-AL-NX-M1-CN

- 1 **GP TYPE** Gauge pressure
- 2 **SI SENS** Silicon sensor
- 3 **06 RANGE** 0...4 bar
- 4 **M3 CONN** PTH13 / ACC54 assembly
- 5 **HA OUT** 4...20 mA, HART protocol, 2-wire
- 6 **D1 DISP** With display
- 7 **S6 MAT** SS316L
- 8 **AL HSG** Aluminium
- 9 **NX EX** Non-Ex industrial
- 10 **M1 OPT** EN 10204 Type 3.1
- 11 **CN OPT** NICO in-house calibration certificate

INCLUDED MANIFOLD — SEPARATELY SPECIFIED

ACC54 — complete model code selected from the NICO Accessories Catalogue

M3 — ACC54 assembly. The applicable ACC54 body and mounting variant for a PTH13 assembly is confirmed with the quotation. The complete ACC54 model code is written on its own order line under the same Tag No. and is never inserted into the PTH13 mother code.

EXAMPLE 4 — OPEN-TANK LEVEL WITH A REMOTE DST41 SEAL

PTH13 · gauge 0...4 bar · arrangement R1 · Ex ia IIC T6 Ga

TRANSMITTER

PTH13-GP-SI-06-DS-HA-D1-S6-AL-IA-CT-BF

- 1 **GP TYPE** Gauge pressure
- 2 **SI SENS** Silicon sensor
- 3 **06 RANGE** 0...4 bar
- 4 **DS CONN** Prepared for DST41
- 5 **HA OUT** 4...20 mA, HART protocol, 2-wire
- 6 **D1 DISP** With display
- 7 **S6 MAT** SS316L
- 8 **AL HSG** Aluminium
- 9 **IA EX** ATEX Ex ia IIC T6 Ga
- 10 **CT OPT** Third-party ISO/IEC 17025 calibration
- 11 **BF OPT** Flat mounting bracket

DST41 SEAL SYSTEM

DST41-R1-SE-S6-S2-AS-F6-A1-RF-C3-E2-00

- 1 **R1 ARR** One remote leg — PTH13
- 2 **SE FORM** Extended flanged seal
- 3 **S6 DMAT** SS316L diaphragm
- 4 **S2 FILL** Silicone 200
- 5 **AS FST** ASME B16.5
- 6 **F6 FSZ** 3 in / DN80
- 7 **A1 RAT** Class 150
- 8 **RF FCE** Raised face
- 9 **C3 CAP** 3 m capillary
- 10 **E2 EXT** 50 mm / 2 in extension
- 11 **00 OPT** No additional option

Example configuration — final availability confirmed with the quotation CONFIRMATION applies to the DST41 line. State the liquid density, the minimum and maximum level, the nozzle and transmitter elevation, the seal elevation, the required LRV and URV and the process and ambient temperature with the enquiry.

CHAPTER 18 · REFERENCE

Final Ordering Examples

DPT11 — differential pressure, flow and sealed closed-tank level

Every code below is verified field by field against the approved Ordering Code sections.

EXAMPLE 4 — GENERAL DIFFERENTIAL PRESSURE WITH A THREE-VALVE MANIFOLD DPT11 · ±1 bar · ACC54 assembly package

TRANSMITTER ASSEMBLY

DPT11-ST-04-M3-HA-D1-S6-AL-NX-CN

- 1 **ST TYPE** Standard DP transmitter 2 **04 RANGE** ±1 bar 3 **M3 CONN** DPT11 / ACC54 assembly 4 **HA OUT** 4...20 mA, HART protocol, 2-wire
5 **D1 DISP** With display 6 **S6 MAT** SS316L HP/LP 7 **AL HSG** Aluminium 8 **NX EX** Non-Ex industrial 9 **CN OPT** NICO in-house calibration certificate

INCLUDED MANIFOLD — SEPARATELY SPECIFIED

ACC54 — complete model code selected from the NICO Accessories Catalogue

EXAMPLE 5 — FLOW MEASUREMENT WITH A FIVE-VALVE MANIFOLD DPT11 · ±1 bar · ACC55 assembly package · Ex ia IIC T6 Ga

TRANSMITTER ASSEMBLY

DPT11-ST-04-M5-HA-D1-S6-AL-IA-CT-BP

- 1 **ST TYPE** Standard DP transmitter 2 **04 RANGE** ±1 bar 3 **M5 CONN** DPT11 / ACC55 assembly 4 **HA OUT** 4...20 mA, HART protocol, 2-wire
5 **D1 DISP** With display 6 **S6 MAT** SS316L HP/LP 7 **AL HSG** Aluminium 8 **IA EX** ATEX Ex ia IIC T6 Ga
9 **CT OPT** Third-party ISO/IEC 17025 calibration 10 **BP OPT** 2-inch pipe bracket

INCLUDED MANIFOLD — SEPARATELY SPECIFIED

ACC55 — complete model code selected from the NICO Accessories Catalogue

ROOT VALVES AND PRIMARY ELEMENT — ORDERED SEPARATELY

ACC56 × 2 — only where the tapping and piping arrangement requires them · OFE16 / FNE17 / VTE15 — separately sized and ordered

The primary flow element is an independent product requiring separate sizing, an order code and approved drawings. Square-root extraction shall be enabled in one location only. Where both **IA** and **SL** are required on one configuration, the combination is confirmed with the quotation.

EXAMPLE 6 — CLOSED-TANK LEVEL WITH ONE HP-SIDE REMOTE SEAL DPT11 · ±0.4 bar · DST41 arrangement H1

TRANSMITTER

DPT11-ST-03-DS-HA-D1-S6-AL-NX-M1-CN

- 1 **ST TYPE** Standard DP transmitter 2 **03 RANGE** ±0.4 bar 3 **DS CONN** Prepared for DST41 4 **HA OUT** 4...20 mA, HART protocol, 2-wire
5 **D1 DISP** With display 6 **S6 MAT** SS316L HP/LP 7 **AL HSG** Aluminium 8 **NX EX** Non-Ex industrial 9 **M1 OPT** EN 10204 Type 3.1
10 **CN OPT** NICO in-house calibration certificate

DST41 SEAL SYSTEM

DST41-H1-SR-S6-S2-AS-F3-A1-RF-C3-E0-00

- 1 **H1 ARR** One remote seal, HP side 2 **SR FORM** Remote flanged seal 3 **S6 DMAT** SS316L diaphragm 4 **S2 FILL** Silicone 200
5 **AS FST** ASME B16.5 6 **F3 FSZ** 1 in / DN25 7 **A1 RAT** Class 150 8 **RF FCE** Raised face 9 **C3 CAP** 3 m capillary 10 **E0 EXT** No extension
11 **00 OPT** No additional option

A one-leg DPT11 system uses **H1** or **L1**, never **R1**. **H1** and **L1** are defined one-seal arrangements. State the construction of the opposite side — direct process connection, dry leg, wet leg or impulse line — in the engineering worksheet. Any construction outside the published H1 / L1 rules is **OR** with an HP / LP engineering schedule.

EXAMPLE 7 — CLOSED-TANK LEVEL WITH TWO MATCHED REMOTE SEALS DPT11 · ±0.4 bar · DST41 arrangement R2

TRANSMITTER

DPT11-ST-03-DS-HA-D1-S6-AL-NX-M1-CN

DST41 SEAL SYSTEM

DST41-R2-SF-S6-S2-AS-F6-A1-RF-C3-E0-00

- 1 **R2 ARR** Two matched remote legs 2 **SF FORM** Flush flanged seal 3 **S6 DMAT** SS316L diaphragm 4 **S2 FILL** Silicone 200 5 **AS FST** ASME B16.5
6 **F6 FSZ** 3 in / DN80 7 **A1 RAT** Class 150 8 **RF FCE** Raised face 9 **C3 CAP** 3 m capillary 10 **E0 EXT** No extension 11 **00 OPT** No additional option

R2 supplies two matched legs of identical seal form, diaphragm size, diaphragm material, fill fluid, capillary construction and length, which improves common-mode temperature compensation. The HP and LP seals are normally at different elevations, so their hydrostatic heads are not equal; include the elevation head explicitly in the LRV and URV calculation.

CHAPTER 18 · REFERENCE

Selection Summary

From application to order lines

The manifold, seal system and primary flow element are always separate order lines under one Tag No.

SELECTION SUMMARY

From application to order lines

APPLICATION	TRANSMITTER	SEAL SYSTEM	MANIFOLD AND PRIMARY ELEMENT
Direct process pressure	PTH13 + direct CONN	—	ACC53 with M2 or ACC54 with M3 where required
Pressure, hot or corrosive media	PTH13 + DS	DST41 DM or R1	—
Open or vented-tank level	PTH13 + DS	DST41 R1 (or DM)	—
General differential pressure	DPT11 + direct CONN or M3	—	ACC54
Filter or strainer monitoring	DPT11 + M3	—	ACC54
Flow measurement	DPT11 + M3 or M5	—	ACC54 or ACC55; ACC56 where required; OFE16 / FNE17 / VTE15
Closed-tank level, one seal	DPT11 + DS	DST41 H1 or L1	Opposite side stated in the worksheet
Closed-tank level, two seals	DPT11 + DS	DST41 R2	—
Compact machine or OEM pressure	PTP30	—	See page 05

ORDER-LINE SUMMARY

Every separate product keeps its own order line under one Tag No.

CONFIGURATION	TRANSMITTER	DST41 SEAL SYSTEM	MANIFOLD	ROOT VALVES	PRIMARY ELEMENT / OTHER
Compact machine pressure	PTP30-...	—	—	—	Snubber, gauge saver or siphon where required
Direct process pressure	PTH13-...-N2-...	—	—	ACC56 where required	—
Pressure with an assembled two-valve manifold	PTH13-...-M2-...	—	ACC53 complete code	ACC56 where required	—
Pressure with an assembled three-valve manifold	PTH13-...-M3-...	—	ACC54 complete code	ACC56 where required	—
Sealed pressure	PTH13-...-DS-...	DST41-DM-...	—	—	—
Open or vented-tank level	PTH13-...-DS-...	DST41-R1-...	—	—	—
Differential pressure	DPT11-...-M3-...	—	ACC54 complete code	ACC56 where required	—
Filter or strainer monitoring	DPT11-...-M3-...	—	ACC54 complete code	ACC56 where required	—
Flow measurement	DPT11-...-M3-... or -M5-...	—	ACC54 or ACC55 complete code	ACC56 ×2 where required	OFE16 / FNE17 / VTE15 — separate catalogue
Closed-tank level, one seal	DPT11-...-DS-...	DST41-H1-... or DST41-L1-...	—	—	Opposite-side construction stated in the worksheet
Closed-tank level, two seals	DPT11-...-DS-...	DST41-R2-...	—	—	—

One transmitter mother code plus all required linked-equipment order lines under the same Tag No. There is no limit on the number of order lines. Each separate product — transmitter, DST41 seal system, ACC53 / ACC54 / ACC55 manifold, ACC56 root valves, OFE16 / FNE17 / VTE15 primary flow element and any other approved linked equipment — keeps its own complete model code on its own line. A dash means the item is not part of that configuration; it does not mean the line may be merged into another.

Before the order is placed. Confirm that every selectable value is a two-character code from the approved tables; that the Ex, SIL, output, housing, display and electrical-connection combination has been verified against the released certificates and the product configuration matrix; and that the manifold, seal system and primary element each appear on their own order line under the same Tag No.

CHAPTER 18 · REFERENCE

Availability

Product availability and how the complete measurement point is ordered

Every separate product keeps its own order line under one Tag No.

AVAILABILITY

What is selectable from this catalogue

PRODUCT	AVAILABILITY	SELECTION
PTH13	Available	Select from the published PTH13 Ordering Code — pages 15 to 20.
DPT11	Available	Select from the published DPT11 Ordering Code — pages 27 to 30.
DST41	Available	Final flange, fill-fluid and capillary selection confirmed with the application data — pages 31 to 34.
PTP30	Available	Available configurations confirmed with quotation — pages 5 to 9.
ACC53 · ACC54 · ACC55 · ACC56	Available	Select from the NICO Accessories Catalogue; each accessory keeps its own complete model code on its own order line.
OFE16 · FNE17 · VTE15	Available	Detailed sizing and Ordering Codes published separately in the NICO Differential-Pressure Primary Flow Elements Catalogue.

ORDERING THE COMPLETE MEASUREMENT POINT

One transmitter mother code plus all required linked-equipment order lines under the same Tag No. Every separate product remains on its own order line — the transmitter, the DST41 seal system, the ACC53 / ACC54 / ACC55 manifold, ACC56 root valves and the primary flow element. The complete accessory or seal model code is never inserted into the transmitter code.

WITH THE ENQUIRY

State the tag number and service, the process fluid, the operating and design pressure and temperature, the ambient temperature, the required calibrated range with LRV and URV, the process connection, the hazardous-area requirement, the electrical entry and the required certification and documentation. For differential-pressure service also state the **maximum static / line pressure**; for level service also state the liquid density, the minimum and maximum level and the tapping and seal elevations.

NICO

NIKAN SANAT KHAVARMIYANEH

Pressure Transmitters

PTP30 · PTH13 · DPT11

PTP30 — Compact Pressure Transmitter

PTH13 — Smart Pressure Transmitter

DPT11 — Differential Pressure Transmitter

DST41 — Transmitter Diaphragm-Seal System

ACC53 · ACC54 · ACC55 · ACC56 — Manifolds and root valves

OFE16 · FNE17 · VTE15 — Primary flow elements





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