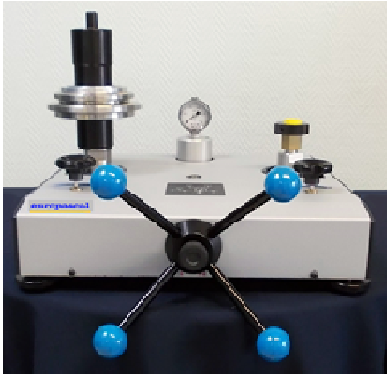


# Pneumatic Deadweight Testers (pressure gauges) EPDT Series



- **Primary standards with measuring ranges from -0.9 bar to 200 bar**
- **Ring weights and weight bell for low gravity center**
- **Two stage spindle for low force application**
- **Quick connectors, no tools required**
- **Accuracy: 0.02% to 0.005% of reading**

EPDT pressure balances are primary standards (piston pressure gauges) and are used to calibrate pressure gauges, pressure transmitters, pressure switches and secondary standards. The piston-cylinder unit with cross-section "A", loaded with weights, is pressurized with pressure "p" by a spindle pump until an exact equilibrium with the applied ring weights "m" is achieved. The highly accurately generated reference pressure  $p = (m \times g) / A$  is transferred to the test object for calibration. The value "g" corresponds to the acceleration due to gravity.

## Technical Specification (20° C)

<b>Model:</b>	<b>EPDT series:</b> Clean and dry gas, e.g. nitrogen (the piston is oil lubricated at ranges $\geq 30$ bar). Supply port: G ¼" at the rear of the base unit.
<b>Features of the pressure generator:</b>	
Materials:	Piping system and fittings $\leq 120$ bar made of copper and brass, $> 120$ bar made of stainless steel 1.4404 (316L) Base plate made of aluminum Housing made of polished stainless steel sheet
Pressure spindle:	Fixed with liners and needle bearings, two-stage
Positioning:	4 adjustable feet and integrated bubble level
Pre-pressure control:	Integrated pressure gauge for pneumatic pressure balance
Test connector:	Quick connector G ½" female, others on request
Motor drive:	Optional motorized, low-vibration belt drive of the piston cylinder unit
Position indicator:	Optional non-contact height position monitoring of the piston by means of sensors, indication by LED

### Piston-Cylinder Unit:

Material: EPDT, measuring range < 10 bar: stainless steel  
EPDT, measuring range ≥ 10 bar: hardened special steel

Repeatability:  $1 \times 10^{-5} \times p$  to  $4 \times 10^{-5} \times p$  depending on measuring range

### Ring weights:

Material: > 100 mbar: stainless steel  
< 100 mbar: light metal

Mass breakdown: 40 g to 8 kg

Mass set: 4 kg to 80 kg

Marking: in the respective unit of measurement

Measurement units: bar, mbar, kPa, mmH<sub>2</sub>O, kg/cm<sup>2</sup>, inH<sub>2</sub>O, psi  
(others on demand)

### Fine masses/weights:

Material: Light metal

Mass breakdown: 4 g to 160 g

## Accessories (optional)

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- Additional piston-cylinder unit
- Fine weights
- Pure oxygen for pneumatic test pumps of EPDT series
- Motorized rotary drive of the piston-cylinder unit, low-vibration belt drive, side-mounted module, additional width approx. 112 mm, auxiliary power 110 or 220 Vac, please specify
- Piston height indication via LED, non-contact sensors
- Computer
- Other measurement units on demand
- Other measurement ranges on demand
- Adjustment of the weights to the local gravitational acceleration
- Factory calibration certificate, DAkkS on request

## Operation

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### Pneumatic Deadweight Testers of EPDT-Series

Suitable transfer media are nitrogen or air in a clean, dry condition. Mount the cleaned test specimen on the test connection and hand-tighten. Place ring weights on the piston-cylinder unit according to the desired test pressure. Roughly set the inlet pressure or vacuum with the inlet valve and pressure gauge and close the valve. Fine-adjust the inlet pressure using the turnstile / pressure spindle until the piston is in equilibrium with the ring weights placed on it. Compare the generated reference pressure with the indication of the test item and note it down. Relieve the pressure balance via the drain valve. Do not disassemble the test object while it is under pressure.

### Accuracy of single piston ( related to the measurement value p)

Model	Measurement range			Accuracy (better than) <sup>1)</sup>
EPDT- 1V	-15	to	-900 mbar	$1.5 \cdot 10^{-4} \times p$
EPDT- 1B	15	to	1000 mbar	$1.5 \cdot 10^{-4} \times p$
EPDT- 10B	0.15	to	10 bar	$1.5 \cdot 10^{-4} \times p$
EPDT- 30B	0.5	to	30 bar	$1.5 \cdot 10^{-4} \times p$
EPDT- 60B	1	to	60 bar	$1.5 \cdot 10^{-4} \times p$
EPDT- 120B	1	to	120 bar	$1.5 \cdot 10^{-4} \times p$
EPDT- 200B	5	to	200 bar	$1.5 \cdot 10^{-4} \times p$

**Note:** The accuracy is determined for a temperature of  $t = 20^\circ \text{C}$ , relative humidity  $R_h = 50 \%$ , acceleration due to gravity/ $g = 9.80665 \text{ m/s}^2$  and an atmospheric pressure = 1013.25 hPa.

### Smallest graduation and number of weights (single piston)

Model	Total weight	mbar		bar or kg/cm <sup>2</sup>		kPa	
		Smallest test step	Number of weights	Smallest test step	Number of weights	Smallest test step	Number of weights
EPDT- 1V	4 kg	5	9	-	-	0.5	9
EPDT- 1B	4 kg	5	9	-	-	0.5	9
EPDT- 10B	16 kg	-	-	0.05	12	5	12
EPDT- 30B	48 kg	-	-	0.25	10	25	10
EPDT- 60B	48 kg	-	-	0.5	10	50	10
EPDT- 120B	48 kg	-	-	1	10	100	10
EPDT- 200B	32 kg	-	-	0.25	12	25	12

<sup>1)</sup> Option:  $\pm 0.008\%$  of reading (from 10% of the respective range)

Model	Total weight	psi		mmH <sub>2</sub> O		inH <sub>2</sub> O	
		Smallest test step	Number of weights	Smallest test step	Number of weights	Smallest test step	Number of weights
EPDT- 1V	4 kg	-	-	50	9	1	11
EPDT- 1B	4 kg	-	-	50	9	1	11
EPDT- 10B	16 kg	0.5	11	-	-	-	-
EPDT- 30B	48 kg	2.5	12	-	-	-	-
EPDT- 60B	48 kg	5	12	-	-	-	-
EPDT- 120B	48 kg	10	12	-	-	-	-
EPDT- 200B	32 kg	2.5	14	-	-	-	-

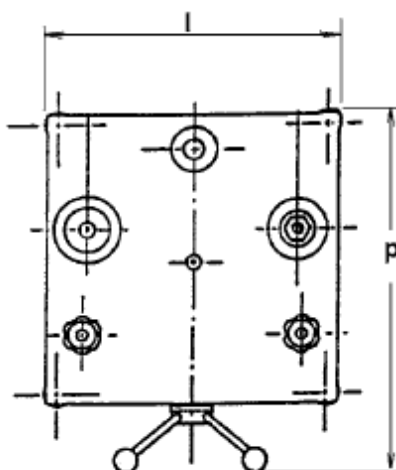
### Additional fine weights for single pistons:

Model	Total of fine weights	kPa		bar or kg/cm <sup>2</sup>		psi	
		Smallest test step	Number of weights	Smallest test step	Number of weights	Smallest test step	Number of weights
EPDT- 1V	-	-	-	-	-	-	-
EPDT- 1B	-	-	-	-	-	-	-
EPDT- 10B	80 g	0.5	4	0.005	4	0.05	4
EPDT- 30B	480 g	0.5	7	0.005	7	0.05	7
EPDT- 60B	480 g	1	7	0.01	7	0.1	7
EPDT- 120B	480 g	2	7	0.02	7	0.2	7
EPDT- 200B	48 g	1	6	0.01	6	0.1	6

### Dimensions (mm) and weights (kg)

Model	Dimensions (W x D x H) of Deadweight Tester in mm during operation*	Weight of Deadweight Tester (without weights)	Dimensions (W x D x H) in mm/weight in kg of the standard wooden external packaging
EPDT- 1V	420 x 420 x 363	17 kg	800 x 500 x 430/15
EPDT- 1B	420 x 420 x 225	17 kg	
EPDT- 10B	420 x 505 x 340	17 kg	
EPDT- 30B	420 x 505 x 340	18 kg	800 x 500 x 430/15
EPDT- 60B			
EPDT- 120B			
EPDT- 200B			

Model	Dimensions (W x D x H) in mm/Weight in kg of the transport case for the deadweight tester	Dimensions (W x D x H) in mm/Weight in kg of the large transport case for weights	Dimensions (W x D x H) in mm/Weight in kg of the small transport case for fine weights	Number of cases
EPDT- 1V	630 x 630 x 370/20	370 x 310 x 300/11	-	1
EPDT- 1B	630 x 630 x 370/20	370 x 310 x 300/11	-	1
EPDT- 10B	630 x 630 x 370/20	370 x 310 x 300/11	310 x 190 x 300/4.5	1
EPDT- 30B	630 x 630 x 370/20	370 x 310 x 300/11	310 x 190 x 300/4.5	1
EPDT- 60B				
EPDT- 120B				
EPDT- 200B				



### Scope of delivery

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- Pressure pump
- Piston-cylinder unit
- Ring weight set
- Operating instructions

#### Accessories (on demand):

- Higher accuracies (premium) of 0.01% to 0.005%.
- Adjustment of weights to local gravitational acceleration
- Tool set consisting of:
  - 1 bag of spare seals
  - 1 elbow connection adapter for pressure gauges with rear connection
  - 1 set of thread adapters (G 3/8"; G 1/4"; 1/2" NPT; 1/4" NPT)
  - 1 open-end wrench SW 27/30
  - 1 Allen key
  - 1 small hammer
  - 1 pointer setter
  - 1 pointer puller with two needles (0,8 mm and 1,5 mm)
- Transport case for pressure pump with piston cylinder unit
- 1, 2 or 3 transport/storage cases for weights
- One set of adapters for test pieces (15 pieces with corresponding seals)
- Suction pump with collecting container for emptying the pressure balance
- Case with quick connector set (17 different threads sizes M-, G-, and NPT-) up to 1200 bar

