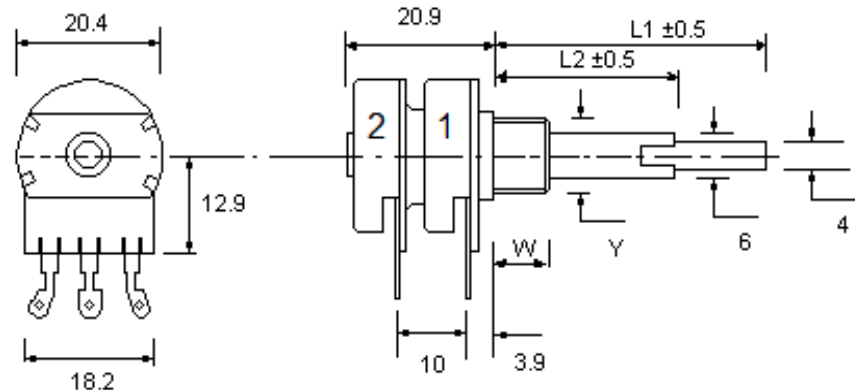


# OW2C20BU

## OW – Ordinary Wiring Terminals (Recommended for soldering)

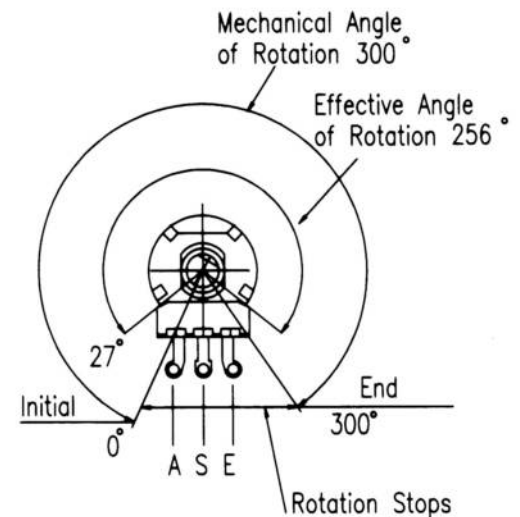


L1 = Spindle controlling gang 2  
L2 = Tube controlling gang 1

- W Mounting Height
- Y Mounting Diameter
- X Spindle Diameter
- L Spindle Length
  
- A Initial Termination
- S Wiper (or moving contact) termination
- E End Termination

### Prefix (Potentiometer terminals)

- BR - Bracket (included with printed circuit terminals)
- FN - Faston (or spade)
- LA - Long bent and away from the spindle
- LT - Long bent and towards the spindle
- OW - Ordinary wiring (eyelets) - **recommended for hand soldering of wires**
- PC - Printed circuit
- XA - Extra long, bent away from the spindle (mainly used with switches)



Total mechanical and effective electrical angles of rotation of potentiometers without rotary switch

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## Technical Data

Rated Power Dissipation @40°C for P20 potentiometers:

0.4W linear law

0.2W nonlinear law

Conductive polymer (plastic) track (over twice the life of carbon tracks)

Effective rotation: 256° nominal

Operating Torque: 0.4 – 1.5 cN.m

Permissible Axial Spindle Load: 100 N (5 Sec. maximum)

Permissible Torque at End Stop: 80 cN.m

Rotation angle: 300° ±5°

Rotational torque of spindle can be made high or low

Life Expectancy of >20,000 cycles (tested at 30 times per minute)

Insulation Resistance: >= 4 Gohms

Rated Resistance: E3 Series

Optional: E6 Series

Linear Law: 1K – 1M (±10%)

Nonlinear Law: 4K7 – 470K

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## ELECTRICAL SPECIFICATION COMMON TO ALL POTENTIOMETERS

Conductive polymer (plastic) track (over twice the life of carbon tracks)

Life Expectancy of >20,000 cycles (tested at 30 times per minute)

Insulation Resistance: >= 4 Gohms

Rated Resistance: E3 Series

- Optional: E6 Series
- Linear Law: 1K - 1M
- Nonlinear Law: 4K7 - 470K

Tolerance on Rated Resistance: ± 20%

- Optional Tolerance on 1K - 1M: ± 10%

Resistance Laws (Taper):

- Linear: A
- Nonlinear: B - Log (Audio) or C - Antilog (Reverse Audio)
- Other laws: Please refer to Sales office

## ELECTRICAL SPECIFICATION UNIQUE TO P20 POTENTIOMETERS

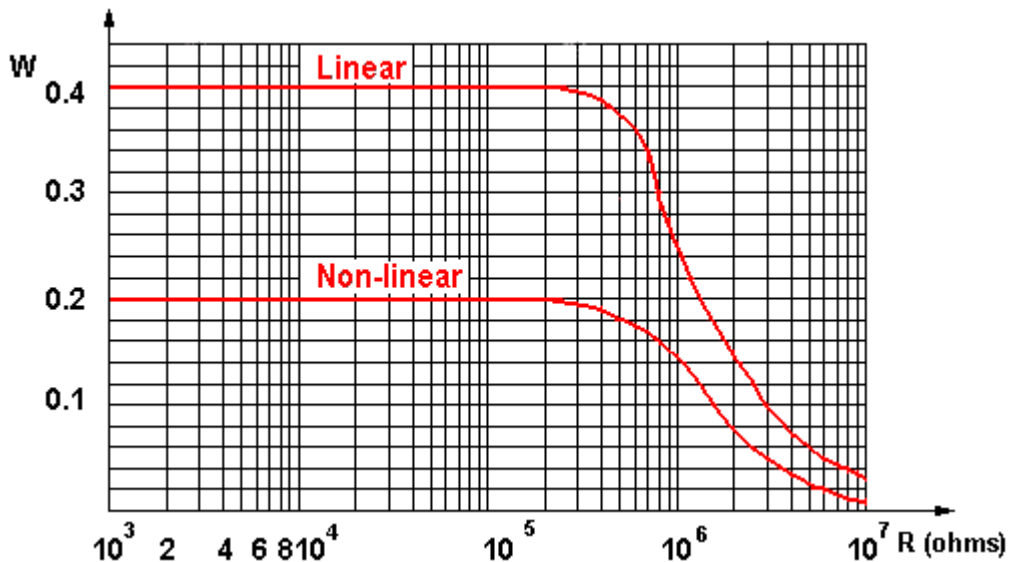
Effective rotation:

- Without a switch: 256° nominal
- With switch: 243° nominal
- With rotary switch: 243° nominal

Rated Power Dissipation @40°C for P20 potentiometers:

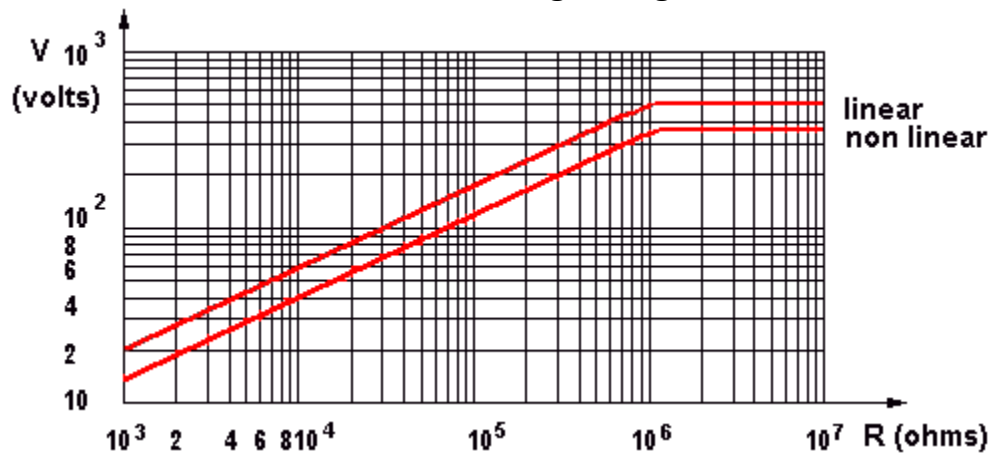
- 0.4W linear law
- 0.2W nonlinear law

**P20 power dissipating curve**



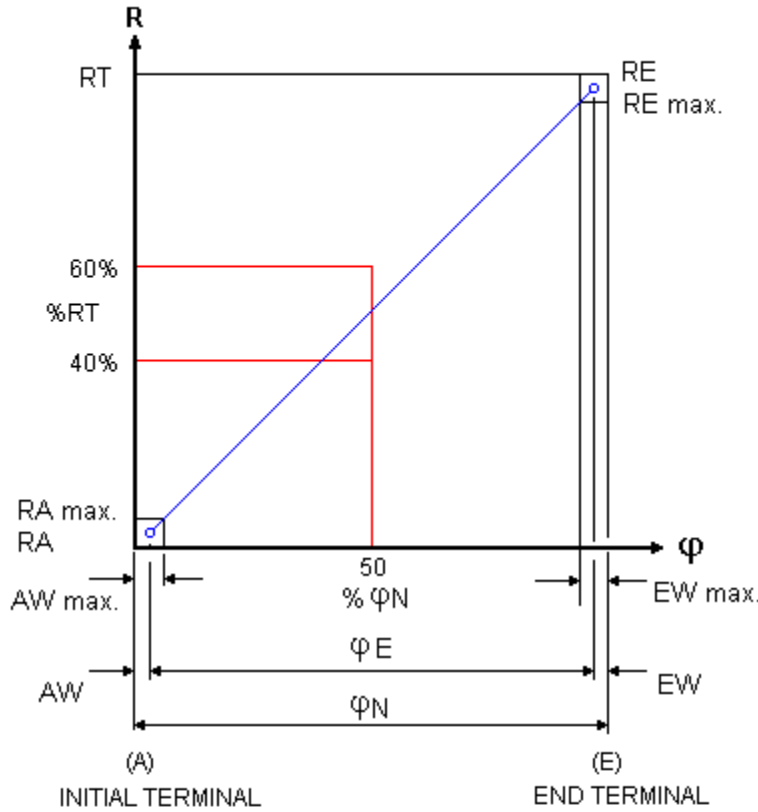
Limiting Element Voltage: 500 V DC for 20mm potentiometers

**P20 maximum working voltage curve**



Insulating Voltage: 1000 V AC for 20mm potentiometers

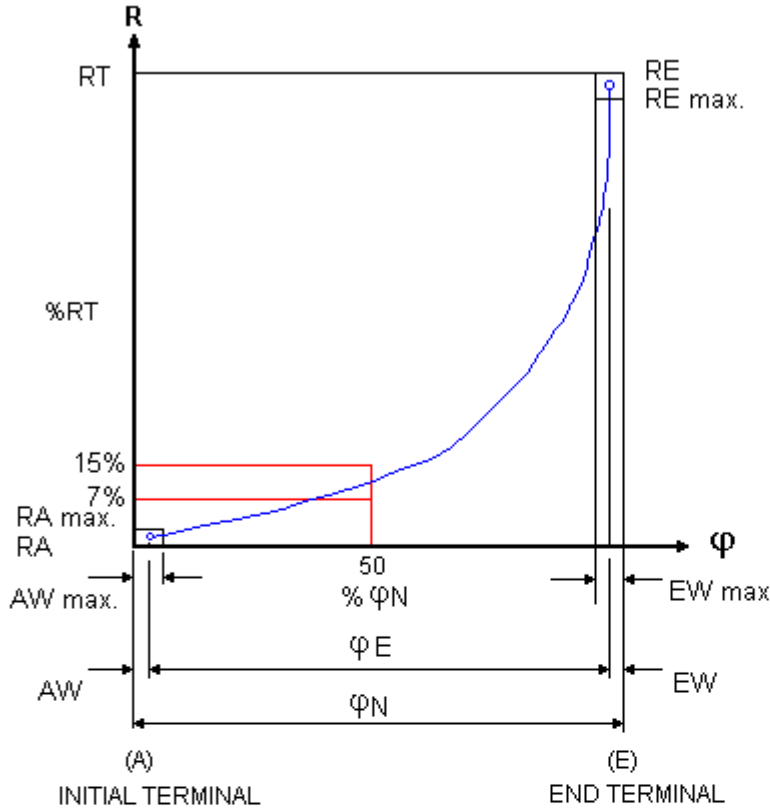
### Resistance law A - Linear



- AW ..... Initial Path ..... AW max. 12%  $\phi_N$
- EW ..... Final Path ..... EW max. 12%  $\phi_N$
- Ra ..... Initial Stop Value .....  $\leq 1 \cdot 10^{-3} RN$  (Minimum 2 ohms)
- RA ..... Hop-on Resistance .....  $\leq 1\% RN$
- Re ..... End Stop Value .....  $\leq 1 \cdot 10^{-3} RN$  (Minimum 2 ohms)
- RE ..... Hop-off Resistance .....  $\leq 1\% RN$
- RN ..... Rated Resistance
- RT ..... Effective Resistance
- $\phi$  ..... Rotation Angle
- $\phi E$  ..... Effective Electrical Angle of Rotation
- $\phi N$  ..... Effective Mechanical Angle of Rotation

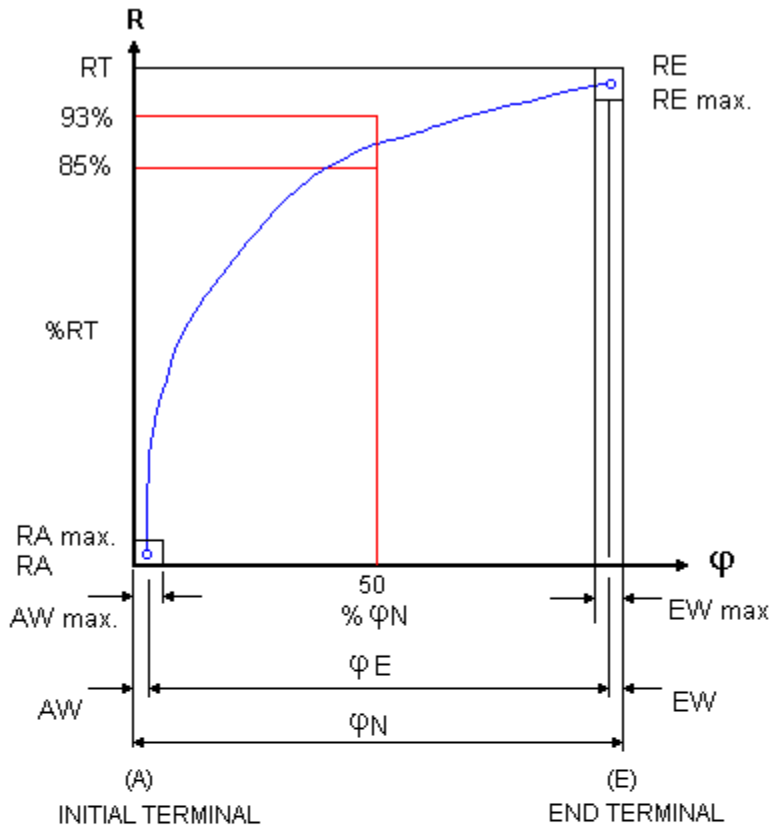


### Resistance law B – Log (Audio)



AW	Initial Path	AW max. 10% $\phi N$
EW	Final Path	EW max. 10% $\phi N$
Ra	Initial Stop Value	$RN \leq 10K \leq 1.10^{-3} RN$ (Minimum 2 ohms) $RN > 10K \leq 2.10^{-4} RN$ (Minimum 10 ohms)
RA	Hop-on Resistance	$RN \leq 10K$ 5% $RN$ $RN > 10K$ 0.15% $RN$
Re	End Stop Value	$RN \leq 100K \leq 2.10^{-2} RN$ $RN > 100K \leq 1.10^{-2} RN$
RE	Hop-off Resistance	$RN \leq 10K < 1\% RN$ $RN > 10K$ 0.5% $RN$
RN	Rated Resistance	
RT	Effective Resistance	
$\phi$	Rotation Angle	
$\phi E$	Effective Electrical Angle of Rotation	
$\phi N$	Effective Mechanical Angle of Rotation	

### Resistance law C – Antilog (Reverse Audio)



AW	Initial Path	AW max. 10% $\phi_N$
EW	Final Path	EW max. 10% $\phi_N$
Ra	Initial Stop Value	$R_N \leq 100K \leq 2.10^{-2} R_N$ $R_N > 100K \leq 1.10^{-2} R_N$
RA	Hop-on Resistance	$R_N \leq 10K < 1\% R_N$ $R_N > 10K 0.5\% R_N$
Re	End Stop Value	$R_N \leq 10K \leq 1.10^{-3} R_N$ (Minimum 2 ohms) $R_N > 10K \leq 2.10^{-4} R_N$ (Minimum 10 ohms)
RE	Hop-off Resistance	$R_N \leq 10K 5\% R_N$ $R_N > 10K 0.15\% R_N$
RN	Rated Resistance	
RT	Effective Resistance	
$\phi$	Rotation Angle	
$\phi E$	Effective Electrical Angle of Rotation	
$\phi N$	Effective Mechanical Angle of Rotation	

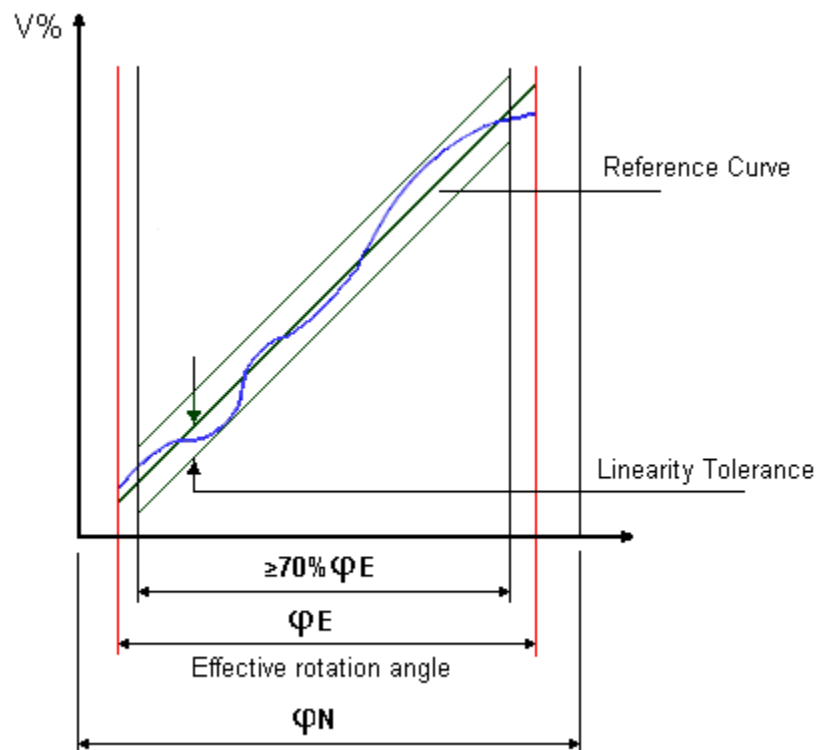
## Linearity

As a basis of assessing Linearity Tolerance the independent method is the most practical, permitting as it does, the reference curve to be aligned as near as possible to the actual output curve. This avoids the use of the theoretical starting and finishing points, it is normal for the customer to realign the achieved curve with series trimmers at each end of the device if required.

Linearity Tolerance is 4% over the Nominal Resistance range of 1K $\Omega$  to 1M $\Omega$ . The Linearity Tolerance is measured on at least 70% of the effective rotation range.

Note. In the case of Terminal and Zero-based linearity, both present constraints which increase the manufacturing difficulty and in consequence have an adverse effect on the product's price and availability.

### Potentiometer linearity

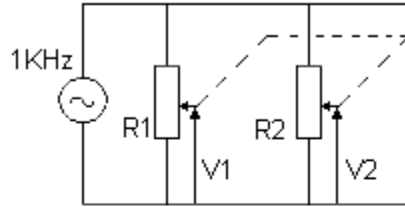


#### Matching Tolerance (For Tandem Stereo Potentiometers)

Tandem Potentiometers have two identical resistor units with the same variation law. The mismatching of the two resistor units, expressed in dB, is measured by the difference between the attenuations introduced by each resistor unit at various points of travel.

- Law A: 4 dB at Attenuation range 0 - 20 dB
- Law B and C: 3 dB at Attenuation range 0 - 20 dB

### Matched Tolerance for Stereo

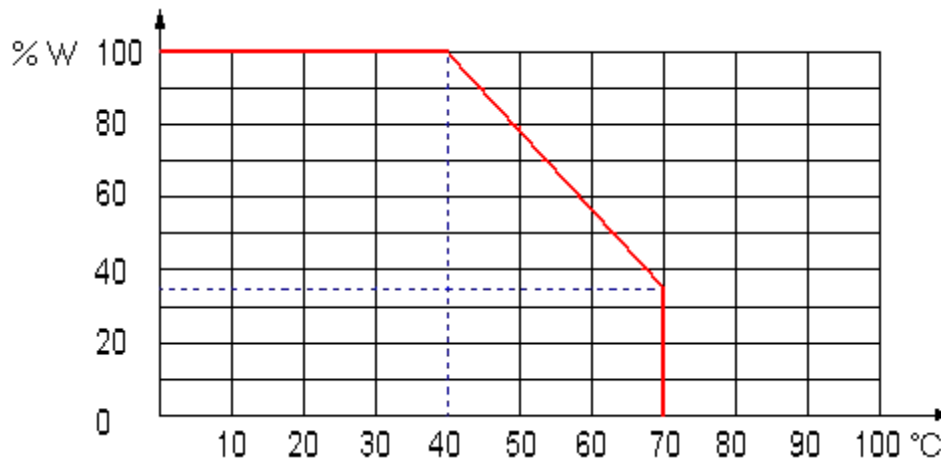


LAW	ATTENUATION RANGE	MATCHING TOLERANCE *
A	0 - 20dB	4dB
B & C	0 - 20dB	3dB

\*Matching Tolerance =  $20 \text{ Log } \frac{V1}{V2}$

Operating Temperature: -25°C to +70°C

### Temperature Derating Curve



Temperature Coefficient of Resistance: +300 -500 ppm

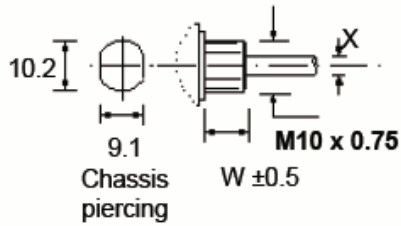


## Components

### P20 Bush Housing (Mounting)

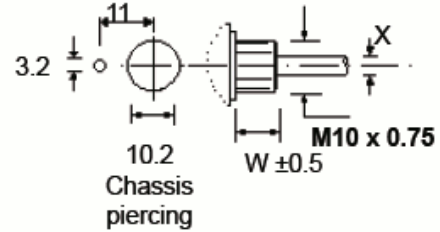
The P20 bushes are available in metal or nylon; with three thread options; and with or without a locating feature:

DIECAST ZINC ALLOY



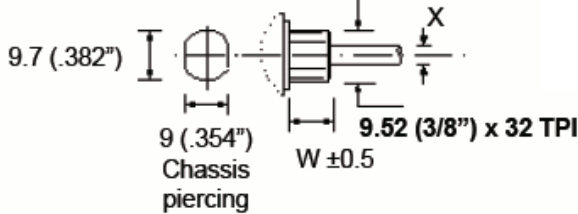
Type C (without locator)	
X (mm)	6
W (mm)	9

DIECAST ZINC ALLOY



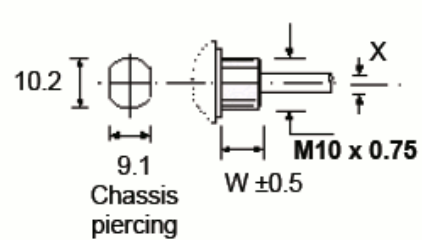
Type CEBS (with locator)	
X (mm)	6
W (mm)	9

DIECAST ZINC ALLOY

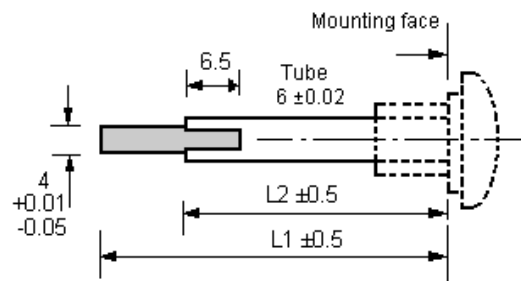


Type CBS (without locator)	
X (mm)	6
W (mm)	8 or 12

GLASS FILLED NYLON



Type CP (GFN)		
X (mm)	6	6.35
W (mm)	7 or 10	7 or 10



TYPE	DESC.	L1 (mm)	L2 (mm)
M15	<b>Metal Fixed</b>	60 (max.)	50 (max.)