

GOING FUTURE TODAY.



HVO V40 P

Universal broadband amplifier



Operating Manual

Before operating the device

HINWEIS: *Read this operating manual through carefully! It contains important information about installation, ambient conditions and maintenance of the device. Keep this operating manual for future use and for handover in the event of a change of owner or operator. A PDF version of this manual can be downloaded on the ASTRO website (there may be a more recent version).*

The ASTRO company confirms that the information in this manual was correct at the time of printing, but it reserves the right to make changes to the specifications, the operation of the device and the operating manual without prior notice.



Contents

Symbols and conventions used.....	page 04
Intended use.....	page 05
Intended audience for this manual.....	page 05
Device description.....	page 06
Important safety information.....	page 08
Warranty conditions.....	page 12
Performance description.....	page 12
Disposal.....	page 13
Installation.....	page 13
Connection and start-up.....	page 14
Configuring the forward path.....	page 14
Configuring the return path.....	page 16
Measurements.....	page 17
Troubleshooting.....	page 18
Maintenance and repair.....	page 18
Block diagram.....	page 19
Technical data.....	page 20
Drilling distances.....	page 22

Symbols and conventions used

Symbols used in this manual

Pictograms are visual symbols with specific meanings. You will encounter the following pictograms in this installation and operating manual:



Warning about situations in which electrical voltage and non-observance of the instructions in this manual pose a risk of fatal injuries.



Warning about various dangers to health, the environment and material.



Warning about thermal dangers due to hot surfaces.



Recycling symbol: indicates components or packaging materials which can be recycled (cardboard, inserts, plastic film and bags). Used batteries must be disposed of at approved recycling points. Batteries must be completely discharged before disposal.



This symbol indicates components which must not be disposed of with household rubbish.

Intended use

The HVO V40 P amplifier is a universal broadband amplifier for bi-directional building distribution and broadband communication systems. It is exclusively designed for signal amplification in unidirectional and bidirectional distribution systems in single-family and multi-family dwellings.

Modification of the devices or use for any other purpose is not permitted and will immediately void any guarantee provided by the manufacturer.

Intended audience for this manual

Installation, configuration and start-up

ASTRO amplifiers are intended to be installed and put into operation by qualified experts who have training which enables them to perform the work required by EN 60728-11 and EN 62368-1. Unqualified persons are not permitted to install and operate the device.

Device description

The device packaging contains the following:

- HVO V40 P broadband amplifier
- Pre-assembled jumpers for device configuration
- Operating manual

- [1] Operating status lamp
- [2] Earth terminal
- [3] Power cable
- [4] Output
- [5] Output test socket
- [6] Return path output test socket
- [7] Input
- [8] Screw mount for housing cover

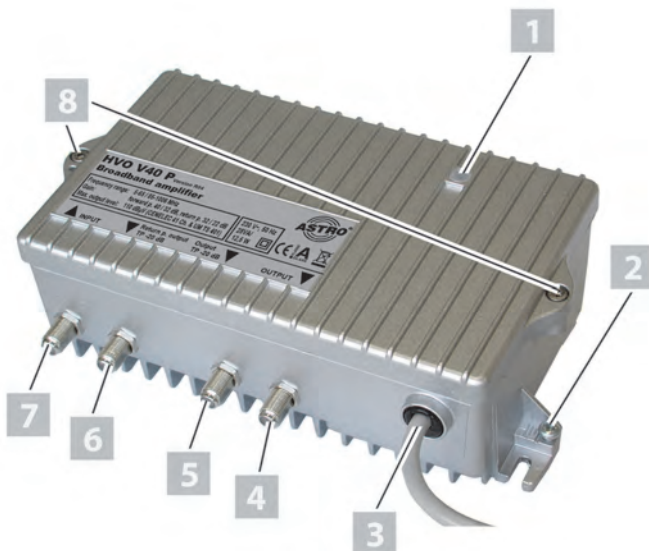


Fig. 1: HVO V40 P amplifier

- [1] Forward path attenuator (pad)
- [2] Input equaliser (pad)
- [3] Cable simulator (pad)
- [4] Forward path gain switch (switch and LED)
- [5] Interstage attenuation (pad)
- [6] Interstage slope (jumpers)
- [7] Operating status lamp
- [8] Attenuator before return path amplifier (pad)
- [9] Return path gain switch (switch and LED)
- [10] Return path tilt equaliser (pad)
- [11] Attenuator after return path amplifier (pad)
- [12] Return path activation (switch "On"/"Off")
- [13] Input test socket (bidirectional)

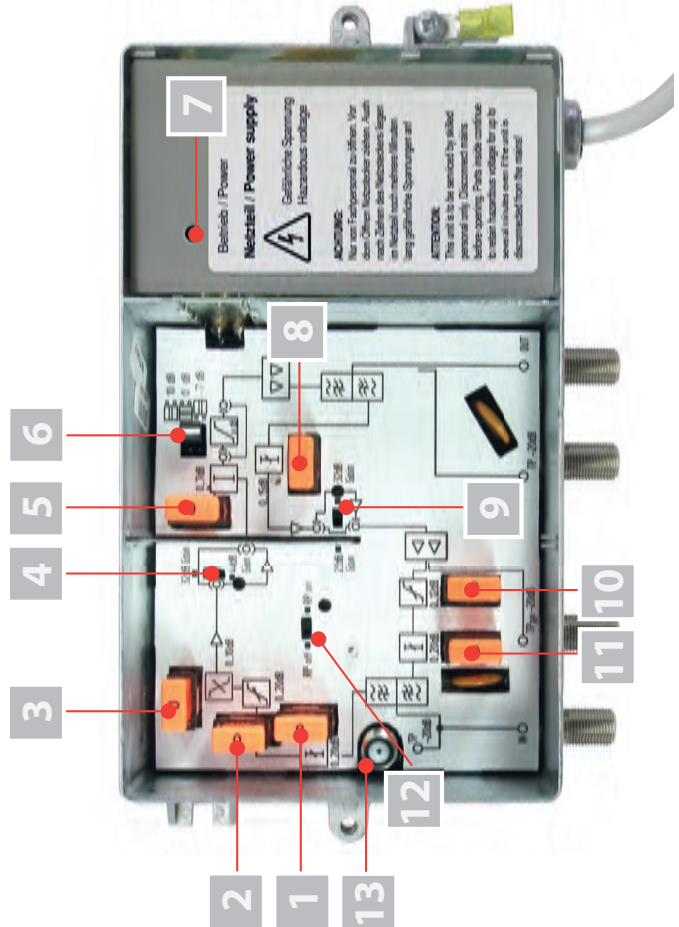


Fig. 2: HVO V40 P amplifier, interior view



The HVO V40 P amplifier has a CE marking. This confirms that the product complies with the relevant EC directives and adheres to the requirements specified therein.



Important safety information

To avoid any potential risks to the greatest extent possible, you must observe the following safety information:

ACHTUNG: *Failure to observe this safety information may result in physical injury due to electrical and thermal dangers!*

Intended use

- Only use the device at approved operating sites and under approved ambient conditions (as described in the following), and only for the purpose described in the section "Proper use".

Before operating the device

HINWEIS: *Read this operating manual carefully. It contains important information about installation, ambient conditions and maintenance of the device. Keep this operating manual for future use and for handover in the event of a change of owner or operator. A PDF version of this manual can be downloaded on the ASTRO website (there may be a more recent version).*

- Check the packaging and the device for transport damage immediately. Do not operate a device that has been damaged.
- Carrying the device by the power cable may damage the power cable or the strain relief and is therefore not permitted.

Installation and operation

- The device may only be installed and operated by qualified persons (in accordance with EN 62368-1) or by persons who have been instructed by qualified persons. Maintenance work may only be carried out by qualified service personnel.
- An installation site must be provided that prevents children from playing with the device and its connections.
- The electrical connection conditions must correspond to the specifications on the device type plate.



- To avoid damage due to overheating, the device may only be installed on vertical surfaces. The connection for the power supply unit must point to the right. The installation basis should be level and non-flammable. Operating position: Device vertical, with power supply output on the right.
- The permitted ambient temperatures specified in the technical data must be complied with. If the device overheats, the insulation used to insulate the mains voltage may be damaged.
- The device and its cable may only be operated away from radiant heat and other sources of heat.
- To avoid trapped heat, ensure there is good ventilation on all sides (minimum interval of 20 cm to other objects). Installing the device in recesses or covering the installation location, for example using curtains, is not permitted. Ventilation openings must not be covered.
- If the device is installed in a cabinet, ensure adequate air convection is possible to avoid exceeding the maximum permitted ambient temperature.
- No objects may be placed on the device.
- The subscriber network must be earthed in accordance with EN 60728-11 and must remain earthed even when the device is removed. In addition, the earth connection on the device can be used. Devices within hand's reach must also be integrated into the potential equalisation. Operating the device without an earth conductor, without earthing the device or without equipotential bonding of the device is not permitted.
- The device does not feature protection against water and may therefore only be operated and connected in dry rooms. The device must not be exposed to spraying water, dripping water, condensation or similar sources of moisture.
- The electrical system supplying current to the device, such as a building installation, must incorporate protective devices against excessive currents, earth faults and short-circuits in accordance with EN 62368-1.
- Caution! Hot surface: Housing components near the cooling fins at the rear or the cooling fins themselves may become very hot. Do not touch these parts.
- The power supply plug is used to disconnect the device from the mains voltage for servicing and in the event of danger and must therefore be accessible and in good working condition at all times. The device is operational when connected to the mains voltage.



- Adhere to all applicable national safety regulations and standards.
- Excess mechanical loads (e.g. falling, impacts, vibrations) may damage the insulation used to provide protection from the mains voltage.
- High excess currents (lightning strikes, surges in the power utility grid) may damage the insulation used to provide protection from the mains voltage.
- If there is no information about the intended use (e.g. operating site, ambient conditions), or the operating manual does not include the corresponding information, you must consult the manufacturer of this device to ensure that the device may be installed. If you do not receive the required information from the manufacturer, do not operate the device.
- In rooms in which the climatic conditions vary (e.g. due to sunlight), the device may only be operated if the permissible ambient temperature can be maintained.
- Disconnect devices with a damaged power cable from the mains (unplug the power supply plug).
- Always use the supplied power adapter (power supply unit) and connect it to a power point with a voltage within the range specified in the "Technical data" section. Failure to observe this warning may result in personal injury or equipment/property damage.
- Do not install the device in locations with excessive dust formation, as this may reduce the insulation from the mains voltage.

Electromagnetic compatibility (EMC)

In order to avoid malfunctions when operating radio and telecommunications equipment, as well as other operating units or broadcasting services, the following must be observed:

- Before installation, make certain that you have checked the device for mechanical damage. Do not use damaged or bent covers or housings.
- During operation, the device must always be covered by the components provided for this purpose. It is not permitted to operate the device when the cover is open.

- The braided shielding or the spring contacts must not be damaged or removed.

Maintenance

- The power indicator only shows whether the DC current, which supplies the device components, has been disconnected. However, if power indicators (on the power supply unit or the device) are not lit up, it is in no way an indication that the device is completely disconnected from the mains. There may still be voltage in the device that is dangerous to touch. Therefore, do not open the device.
- Read carefully: EN 60728-11, Safety requirements/No service work during electrical storms!
- Disconnect the mains plug before cleaning the device!**Repair**
- Repairs may only be performed by the manufacturer. Improperly performed repairs may result in considerable dangers for the user.
- Do not operate devices with a damaged power cable. You must have the cable repaired by the manufacturer.
- If malfunctions occur, the device must be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.

General information

- Store or use the device in a safe location, well out of reach of small children. It may contain small parts that can be swallowed or inhaled. Dispose of any small parts that are not needed.
- Plastic bags may have been used for packaging the device. Keep these plastic bags away from babies and children to avoid any danger of suffocation. Plastic bags are not toys.
- Do not store the device near chemicals or in places in which any leakage of chemicals may occur. In particular, organic solvents or fluids may cause the housing and/or cables to melt or disintegrate, presenting a danger of fire or electric shock. They may also cause device malfunctions.
- Do not connect the supplied mains adapter to any other products.



Warranty conditions

The general terms and conditions of ASTRO Strobel GmbH apply. They can be found in the current catalogue or on the Internet under “www.astro-kom.de”.

Performance description

ACHTUNG: *Instructions regarding the necessary protective measures to prevent electrostatic discharges in the device according to DIN EN 61340-5-1 must be observed!*

The HVO V40 P amplifier can be flexibly configured for future multi-media cable networks:

- Adjustment of gain in the forward and return paths using switches
- Adjustment of local level conditions using adjustable attenuators and equalisers (pads)
- Pre-equalisation of the outgoing cable lines is possible using the interstage slope (activated with jumpers)
- The return path can be deactivated with a switch
- Equaliser and attenuator in the return path (pads)
- Additional attenuator before the return path amplifier



All of our packaging materials (cardboard boxes, inserts, plastic film and bags) are completely recyclable.

After use, this device must be disposed of in an orderly manner as electronic scrap, in accordance with the current disposal regulations of your district/country/state.

ASTRO Strobel is a member of the Elektro system solution for the disposal of packaging materials. Our contract number is 80395.

Installation

VORBEREITUNG:

Before you can install the device, you must first drill two holes in a vertical installation surface and insert suitable wall plugs into the holes.

The required borehole distance is 196.5 mm horizontally and 69 mm vertically (see Fig. in the “Drilling distances” section, p. 21).

The following describes how to install the device:

AUFGABE

1. Place the back of the device against the installation surface so that the oblong holes on the lower section of the housing are above the two wall plugs. The connection sockets of the device must point downwards.
2. Now screw the device in place using suitable screws.

ERGEBNIS:

The module is now installed and can be connected.

Connection and start-up

VORBEREITUNG:

To connect the amplifier to coaxial cables, you must first fit them with F connectors 75 Ohm. F connectors are available in various designs, so that direct connection of different cable diameters is possible.

The following describes how to connect the amplifier and coaxial cables:

AUFGABE

1. Plug the F connectors into the corresponding sockets on the amplifier (input [7] and output [4], see picture left) and screw the outer ring of the F connector tight.
2. Make sure the coaxial cables are laid with a sufficient bending radius.
3. Connect the unit to the mains voltage by inserting the mains plug [3] (see left).

ERGEBNIS:

When you have connected the mains voltage and the coaxial cables, the device is ready for operation and the operating status lamp [1] lights up. The levels can now be set.



Configuring the forward path

The default configuration for the amplifier is as follows (see Fig. 2, page 3):

- The gain is set to 32 dB in the forward path and 22 dB in the return path
- The return path is deactivated
- The jumpers [6] for activating the interstage slope in the forward path are set to 0 dB
- 0 dB pads are inserted in all other slots

ACHTUNG: *The maximum operating level must not be exceeded! (maximum input level = output level minus the set gain for 1006 MHz)*

HINWEIS: *The gain values given in the “Technical data” section apply when at least two setting elements (e.g. input equaliser and interstage slope) are used.*



ACHTUNG: Before you open the device for configuration: Make certain you have observed the specifications in the sections “Important safety information” and “Maintenance and repair”. Failure to observe this safety information may result in physical injury due to electrical and thermal dangers!

AUFGABE

1. Remove the housing cover by loosening both screws [7] (see picture above left).
2. The HVO V40 P amplifier has an attenuator and pad [1] in the forward path, as well as a tilt equaliser [2] and a cable attenuation simulator [3] and pad (see left). **Important: To achieve equalisation values between 14 and 20 dB with the tilt equaliser and 5 and 10 dB with the cable attenuation simulator, you may have to insert pads with values up to 5 dB higher.**

You can use them to set the required attenuation and equalisation by inserting the corresponding pads. This allows you to compensate for the residual pre-equalisation of incoming signals.

3. Select the gain (40 or 32 dB) in the forward path by switching the switch [4] accordingly. Observe the label next to the jumper. In the 40 dB position, the LED lights up red; in the 32 dB position, the LED remains dark.
4. Between the amplifier stages (interstage), you can also set a pre-equalisation (0.7 or 10 dB slope) of the outgoing cable length by inserting the jumper [6] accordingly (see picture left). Observe the label next to the slot.
5. In addition, you can set an interstage attenuation between 0 and 7 dB by inserting the corresponding pad into the slot [5] (see left). Please note, that the maximum output level will be reduced accordingly.

The device is now configured for the transmission of forward signals. If you want to put the return path into operation, read the notes in the section “Configuring the return path” below.

ACHTUNG: In cable networks that do not use a return path, the return path must remain deactivated.

Configuring the return path

ACHTUNG: Before you open the device for configuration: Make certain you have observed the specifications in the sections “Important safety information” and “Maintenance and repair”. Failure to observe this safety information may result in physical injury due to electrical and thermal dangers!

VORBEREITUNG:

To transmit return signals, the amplifier must first be configured accordingly.

The following describes how to configure the amplifier for the transmission of return signals:

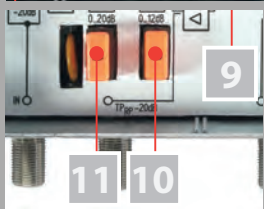
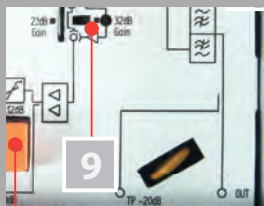
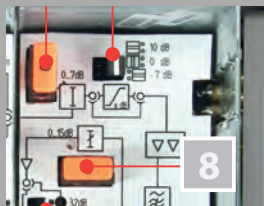
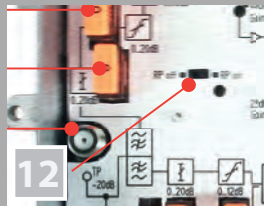
AUFGABE

1. To activate the return path, you must first set the return path activation switch [12] to the “On” position (note the label next to the switch). The LED next to the switch then lights up blue.
2. There is an attenuator [8] before the return path amplifier, which you can adjust as needed by inserting the pad (0...15 dB) in order to reduce excessively high input levels.
3. Select the gain (32 or 22 dB) in the return path by switching the switch [9] accordingly. Observe the label next to the switch. In the 32 dB position, the LED lights up red; in the 22 dB position, the LED remains dark.
4. Set the tilt equaliser in the return path [10] (see picture left) according to the required cable pre-equalisation.
5. Adjust the attenuator [11] after the return path amplifier by inserting the appropriate pad to match the attenuation in the downstream network (see left).

ERGEBNIS:

The device is now configured for the transmission of return signals.

ACHTUNG: If you switch off the return path via switch [12], both sides of the diplex filter in the return path range



are terminated with 75 Ω ! The pads in the return path range must be removed in the process!

Measurements

ACHTUNG: *Before you open the device: Make certain you have observed the specifications in the sections “Important safety information” and “Maintenance and repair”. Failure to observe this safety information may result in physical injury due to electrical and thermal dangers!*

At the input, there is a bidirectional test socket [13] (see picture left) with 20 dB decoupling attenuation. You can use it to:

- Estimate the input level for the forward range
- Determine the output level for the return range according to the setting elements (see the “Configuring the return path” section)
- Feed in return signals behind the return path amplifier in the upstream direction
- Feed in forward path signals in downstream direction

The directionally coupled test socket [5] (see picture centre left) also has 20 dB decoupling attenuation. You can use it to:

- Feed in the return signal to set the return path level
- Determine the output level for the forward range

In the return path, there is another directionally coupled test socket [6] (see picture bottom left). Using this socket, you can measure the return signal before the setting elements.

HINWEIS: *After configuring the amplifier and completing the measurements, it is strongly recommended to terminate both test sockets with FUR 75 terminating resistors to ensure operation in compliance with the standards.*



Troubleshooting

If the device is not functioning correctly, perform the following checks:

- Check whether the device is connected to the required mains voltage (230 V~, 50 Hz).
- Check whether the coaxial cables are connected correctly and make sure there are no breaks or short circuits in the connectors.
- Check whether the output level on the device is within the permissible limits for the operating level.

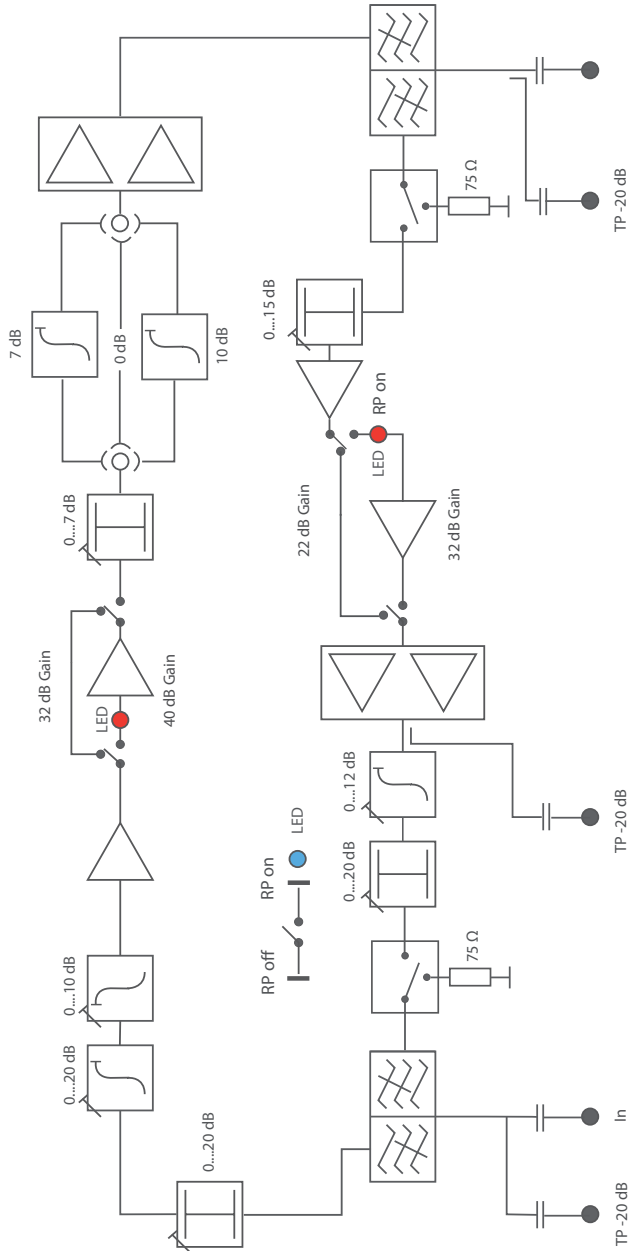
If the problem cannot be resolved, please contact ASTRO customer service.

Maintenance and repair

ACHTUNG: *It is essential that the following safety information be observed when performing maintenance and repair work. Failure to observe this safety information may result in physical injury due to electrical and thermal dangers!*



- The power indicator only shows whether the DC current, which supplies the device components, has been disconnected from the mains voltage. If the power indicator (for the power supply unit or the device) does not light up, it does not mean that the device has been fully disconnected from the mains voltage. There may still be voltage in the device that is dangerous to touch. Therefore, do not open the device.
- Read carefully: EN 60728-11 Safety requirements: No service work during thunderstorms.
- Disconnect the mains plug before cleaning the device!
- A defective device may only be repaired by the manufacturer to ensure that components with the original specification are used (e.g. power cable, fuse). Improperly performed repairs may result in considerable dangers for the user or installer. If malfunctions occur, the device must therefore be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.

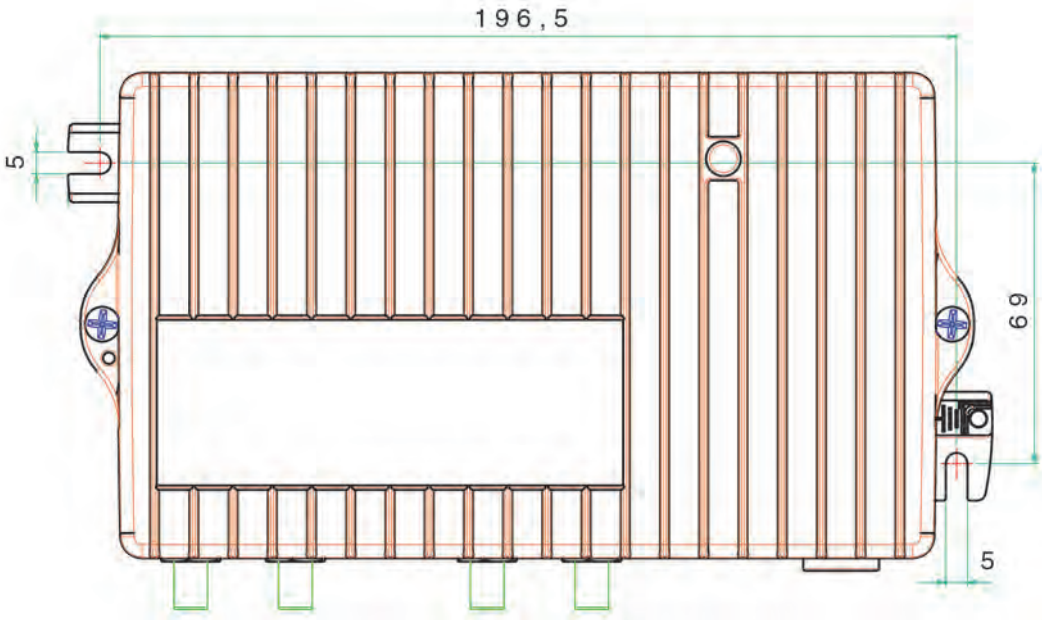


Technical data

Type		HVO V40 P
Order number		217 400
EAN-Code		4026187160357
Forward path		
Frequency range	[MHz]	85 - 1006
Gain	[dB]	40 / 32 ± 1, switchable
Frequency flatness	[dB]	± 0,8
Noise figure	[dB]	≤ 5
Return loss	[dB]	18 and at 40 MHz -1,5 dB/octave
Cable simulator at the input	[dB]	0 bis 10, Pad, Deemphasis
Attenuation (Input)	[dB]	0-20, Pad
Interstage attenuation	[dB]	0 to 7, Pad
Equalizer (Input)	[dB]	0 - 20, Pad, Preemphasis
Interstage Slope	[dB]	0, 7 oder 10, pluggable with jumpers
Testpoints Input / Output	[dB]	Bi, 20 ± 2,5 / RK, 20 ± 1
Maximum output level		
acc. EN 50083-3		
UM TR 406, 94 ch. + 33 UKW	[dBμV]	109
UM TR 406, 112 ch. + 33 UKW		108
Return path		
Frequency range	[MHz]	5 - 65, activatable with switch
Gain	[dB]	32 / 22 ± 1, switchable
Noise figure	[dB]	≤ 4,5
Attenuation	[dB]	Input: 0 - 15, Pad; Output: 0 - 20, Pad
Equalizer (Output)	[dB]	0-12, Pad
Testpoints	[dB]	RK, 20 ± 1 before and 20 ± 1 behind adjustment elements
Maximum output level		
nach UM TS 401		
medium system load	[dBμV]	120
full system load		116
VFKD 1TS 140		full system load
Common data		
Mounting and operation heighth		< 2000 m over N.N.
Supply voltage	[V- /Hz]	230 / 50
Power consumption	[VA] / [W]	33 / 14,5
EMC		accord. EN 50083 -2

Ambient temperature	[°C]	-15...+50
Housing (W x H x D)	[mm]	210 x 120 x 66
Weight	[kg]	1.6

Drilling distances





ASTRO Strobel Kommunikationssysteme GmbH

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Change management and copyright:

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