VOL 1

Weatherproof call stations

NEUMANN®

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NEUMANN ELEKTRONIK GMBH

Weatherproof call stations

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Glossary
Main features.

DS 6 / TIMM

Full compatibility with DS-6 and TIMM system. Remotely configurable and remotely monitorable by DS-6 / TIMM system.

U_{k0}

**U_{k0} interface.
Compatibility with DS-6 and TIMM system via Neumann U_{k0} Adapter.**

U_{p0}

**U_{p0} interface.
Compatibility with DS-6 and TIMM system via Neumann U_{p0} Adapter.**

analogue

**Analogue interface.
Compatibility with DS-6 and TIMM system via Neumann Analogue Adapter.**

digital

Digital communication interface.

DS 22

The new Neumann DS-22 system.

SIP

SIP based communication interface.

redundant

Redundant use possible.

EX-protection through flame-proof enclosure. ATEX certified.

customisable & replaceable

Inserts / Talk buttons interchangeable and expandable.

fully metallized inserts

Fully metallised inner casing and fully metallised inserts.

optional dial pad

Optional dial pad.

expandable

Expandable with additional housing.

EMV Safe

Protected against electromagnetic interference (EMC).

19”

Intended for 19“ rack built-in installation.

2 Wire Technology

Two-wire technology. Allows up to 6km range, depending on the technology used.

Excellent speech intelligibility.

Microphone sensitivity and integrated loudspeaker can be adjusted directly on location.

Switchable volume reduction e.g. for night operation.

Service-friendly design - solderless extensions.

UP TO 6 km

Up to 6km range.

7 kHz

Frequency range.

half / full duplex

Half / full duplex compatibility.

serverless

Serverless structure. Just two call stations connected via a network cable function as an independent communication network.

Wireless Network

Can be used in a wireless LAN network.

serverless scalable

Serverless extension of the communication network. The call stations can be controlled directly among each other.

Low line requirement.

8Ω Broadband loudspeaker

Integrated full range loudspeaker.

LC-Display

LC display integrated.

Slot for text memory

Slot for optional USB voice storage device.

up to 112 keys

Largest possible number of keys.

Text memory

Integrated voice memory.

High resistance

Dust and waterproof, glass-fibre reinforced polyester housing. Use indoors as well as outdoors and in harsh environments.

IP65

Protection class according to DIN EN 60529, respectively IEC 60529.

ultra compact

Compact design.

25W / 100Volt additional amplifier

25W / 100 Volt additional amplifier solderless retrofittable on location.

modular

Modular design. Adaptation to customer and project-specific requirements possible.

Intended for use in railcars (locomotives, railway carriages) and driving trailers for local rail traffic.

17“

Robust touch monitor 17“ with integrated PC.

Touch

Touch call station. Operation is via a touch-sensitive monitor.

Included

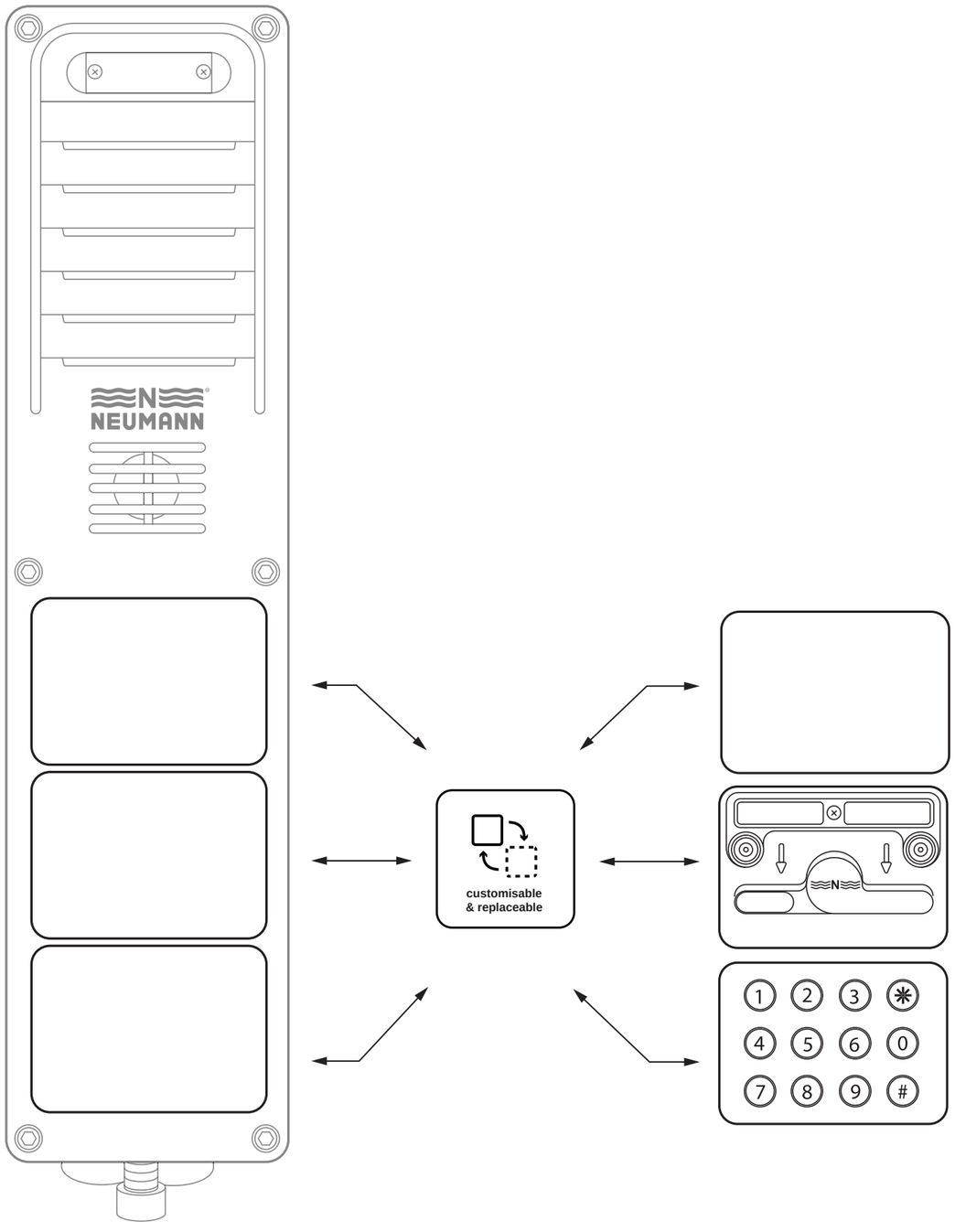
Incl. table microphone with pop protection, freely placeable (wired).

PoE

Power supply via PoE interface

Customisable

**Freely programmable interface pages.
Free key assignment as WL target keys or for local functions.**



Configurable
Replaceable
Expandable

Due to the different operating elements, adaptation to customer and project-specific requirements is possible at any time. Depending on the type, the housing can be configured with a dial pad in combination with double toggle speech button for the intercom.

The „Plug&Play“ system enables the components to be replaced quickly. They can be mounted on location without any soldering work.

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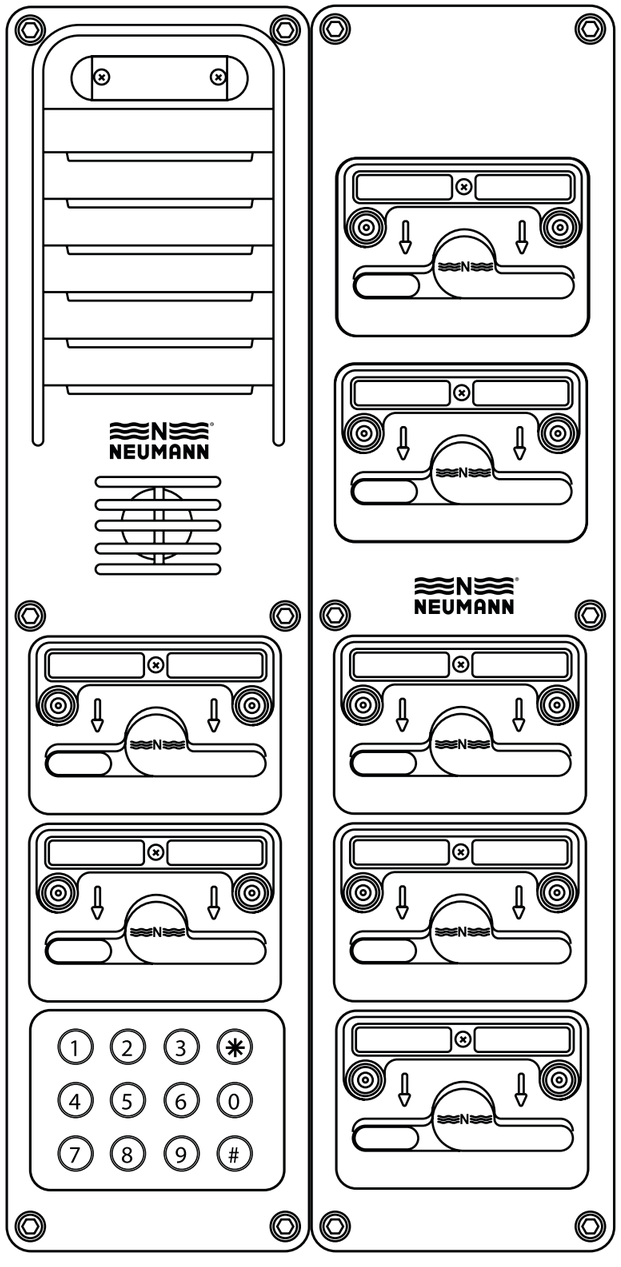
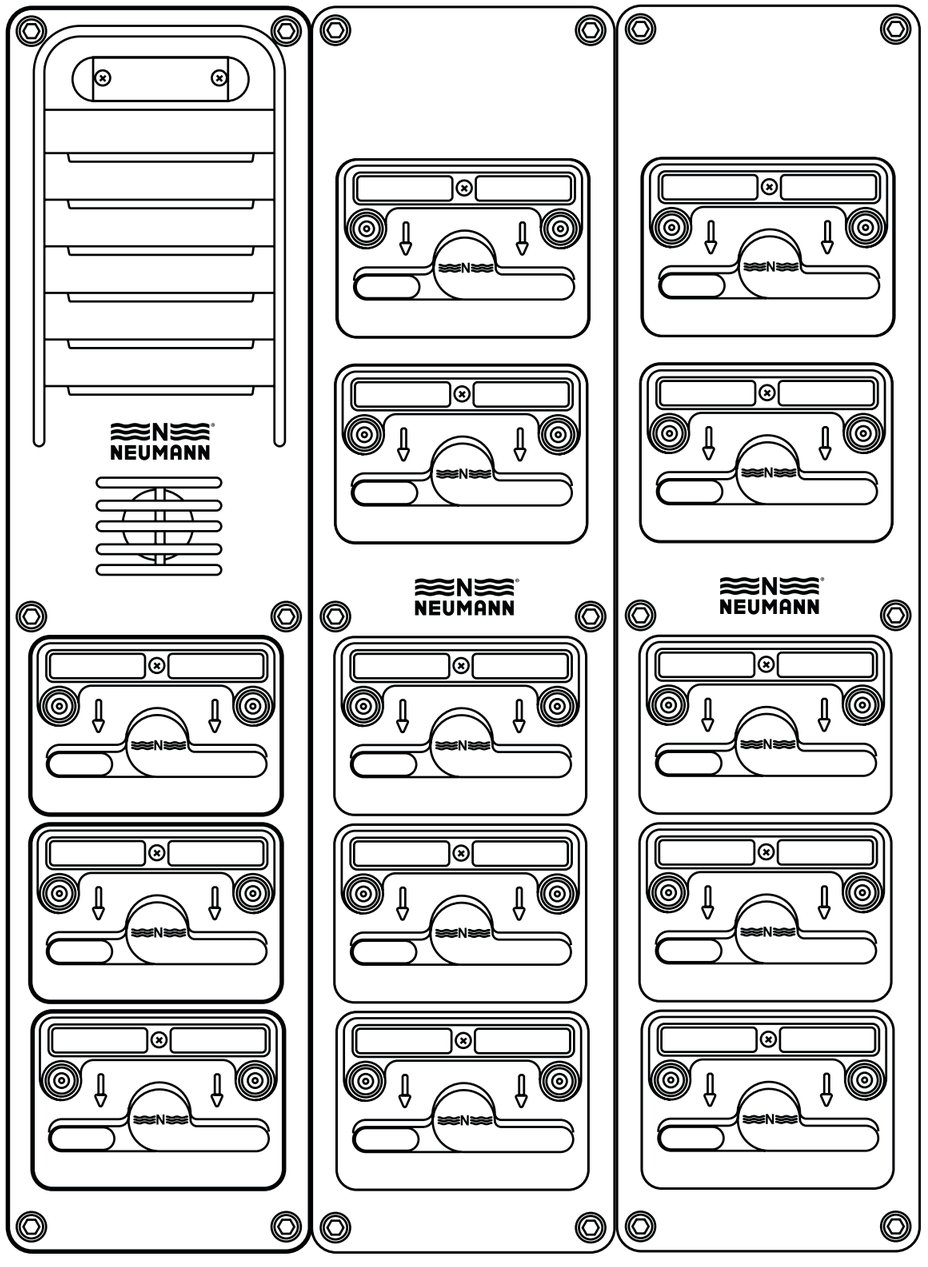
Example of use

NEW



Example of a possible extension of the call stations with 4 speech keys and a dialling keypad (WFD U_{p0} and DS-22 WFD SIP) by a WFD additional housing with 10 additional speech keys.

NEW



Example of a possible extension of the call station with 6 speech keys (WFD U_{p0} and DS-22 WFD SIP) by a WFD additional housing with 20 additional speech keys.

1 156 3

The photos shown are for reference only, the actual product may differ.

Weatherproof call stations

DS-6 DKS IP
Digital DS-6 IP crane call station

DS 6 | TIMM | serverless | Wireless Network | 8Ω Broadband loudspeaker | 12 kHz | Slot for text memory | IP65 | + more

https://neumann-elektronik.com/ds-6-kransprechstelle

- Full compatibility with DS-6 and TIMM system
- Remotely configurable and monitored by DS-6 / TIMM system
- Allows direct voice communication with other terminals and telephones
- Radio link function[1)]
- IEEE 802.11a/b/g/h/I and IEEE.11n
- 2.4 GHz and 5 GHz
- Redundant use
- Integrated full-range speaker 1W, 8Ω
- Includes a mounting plate with access latches
- 16 illuminated push buttons (line keys)
- Integrated power supply with 230V input voltage
- Ethernet connection with PoE

The digital IP crane call station with external WLAN can be used in conjunction with the DS-6 decentralised communication system.

It is connected via wireless LAN to a DS-6 ground station as an access point. The call station enables direct voice communication with other terminals. It can also be used for loudspeaker announcements and even programmable local functions. The call station has 16 line keys.

It can be used with both IEEE 802.11a/b/g/h/I and IEEE.11n standards for WLAN connection with two different frequency bands, 2.4 GHz and 5 GHz.

In addition to the destination buttons for WL/EL, the call station has a volume control and an optional voice memory.

For easier mounting on the crane operator‘s seat, the call station is supplied including a mounting plate with quick-release fasteners. By moving the mounting plate backwards, the call station can also be used as a wall-mounted station.

When using the call station, a WLAN access client is required for mounting in the crane cabin. The WLAN access client and the additional antennas for mounting outside the crane cabin are not included in the scope of delivery.

1) Additional WLAN equipment is required (external WLAN)

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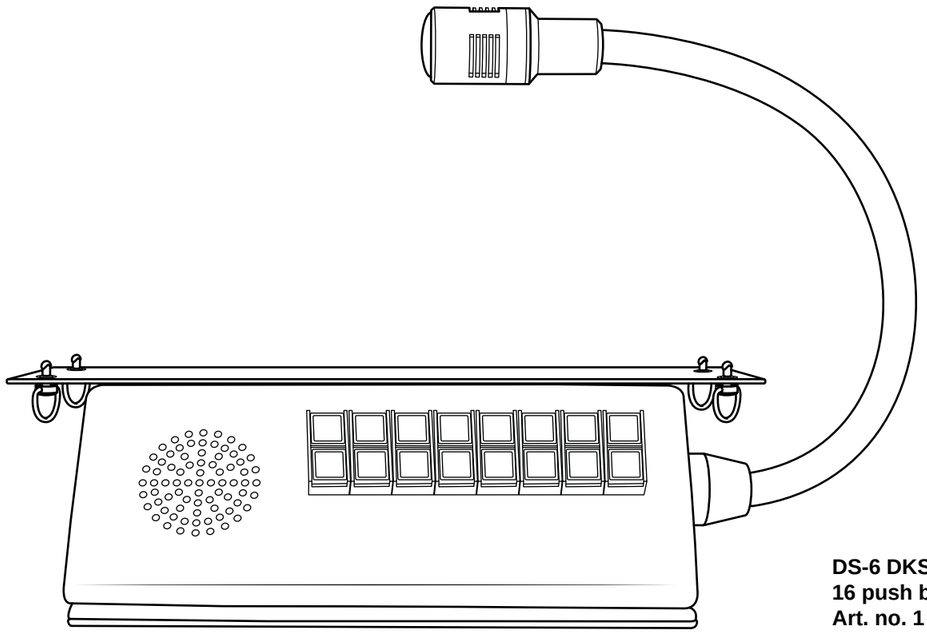
DS-6 DKS IP
Digital DS-6 IP crane call station



DS-6 DKS IP
16 push buttons
Art. no. 1 156 3

Art. no.	1 156 3
Mechanical data	
Weight	Approx. 5kg
Housing dimensions (HxWxD)	270mm x 194mm x 90mm (without gooseneck and without mounting plate)
Housing colour	Orange (RAL 2004) smooth finish
Material	
Number of push buttons	16
Electrical data	
Nominal power consumption	5W
Maximum power consumption	10W
Frequency range	100Hz to 12kHz
Connectivity	
Call station power supply	Integrated power supply unit with 230V / 50Hz input voltage
Ethernet interfaces	2
Ethernet protocol	IEEE 802.3u
WLAN Standard	IEEE 802.11 a/b/g/h/i
Range (depending on the antenna used, frequency range and data rate)	≥ 100 m
Transmission protocol	Neumann DS-6 IP Protocol
Environmental conditions	
Temperature range	0°C to +50°C
Protection class according to DIN EN 60529 or IEC 60529	IP65

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DS-6 DKS IP
Digital DS-6 IP crane call station

Accessories	
5 009 4	DS-6 configuration software
5 007 2	Software DS-6 Manager
5 096 0	TIMM Config
5 095 9	TIMM View
21 4 1143 001 7	USB Stick
91 9 1116 946 7	Indoor WLAN access client / point according to IEEE 802.11 a/b/g/h/n equipped with two radio modules. For use in the crane cabin and/or as a ground station for the frequency bands 2.4GHz and 5GHz. Protection class: IP30
91 9 1116 945 6	Outdoor WLAN access client / point according to IEEE 802.11 a/b/g/h/n. Use in the crane cabin and/or as ground station for the frequency bands 2.4GHz and 5GHz. Protection class: IP65/67
94 9 1412 102 3	Power supply unit for supplying the WLAN access client / point for mounting rail installation (only suitable for indoor use)
94 9 1412 103 4	Power supply unit for supplying the WLAN access client / point for mounting rail installation (for outdoor use, the unit must be housed in a weatherproof enclosure)
91 9 1150 019 6	Omni-directional rod antenna for outdoor use. Frequency band: 5GHz
91 9 1150 018 5	Omni-directional rod antenna for outdoor use. Frequency band: 2.4GHz
99 9 1980 263 6	3m antenna connection cable
91 9 1111 446 7	LED lamp, white
92 9 1216 026 8	Key cap, clear
22 3 0101 156 1	Bracket for crane call station
99 9 1980 240 1	2m power supply cable with moulded connector 7/8“ and screw cap, IP67
99 9 1980 241 2	5m power supply cable with moulded connector 7/8“ and screw cap, IP67
99 9 1980 242 3	10m power supply cable with moulded connector 7/8“ and screw cap, IP67
99 9 1980 245 6	2m network connection with moulded plugs, M12 coupling on one side, IP67
99 9 1980 246 7	5m network connection with moulded plugs, M12 coupling on one side, IP67
99 9 1980 247 8	10m network connection with moulded plugs, M12 coupling on one side, IP67
98 9 310 7041 2	Access locking ring
98 9 310 7042 3	Hanger handle with quick release fastener
98 9 310 7040 1	Access Shock Absorber
92 9 1216 022 4	Lamp puller
92 9 1215 051 5	Key cap puller

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1 573 6

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Weatherproof call stations

DS-6 WFD IP
Weatherproof digital DS-6 IP call station

DS 6 | TIMM | PoE | serverless | modular | High resistance | redundant | + more

https://neumann-elektronik.com/wetterfeste-digitale-ip-sprechstelle

- Full compatibility with DS-6 and TIMM system
- Remotely configurable and remotely monitorable by DS-6 / TIMM system
- Redundant use
- Switchable volume reduction e.g. for night operation
- Subordinate circuit as standard
- Adjustable loudspeaker volume
- Line keys can be freely assigned as destination keys
- Indication of busy and call signaling by LEDs
- Microphone monitoring
- Three double-toggle speech keys with opto-couplers, each for two lines
- Integrated electret microphone
- Integrated loudspeaker
- One PoE interface
- Dust and waterproof fiberglass-fibre reinforced polyester housing

The weatherproof digital call station enables direct intercom connections with other call stations and loudspeakers. It is suitable for use indoors as well as outdoors and in harsh environments, e.g. in heavy industry operations.

When the robust double toggle speech keys are pressed, non-contact light barrier (opto-coupler) are activated, which allows permanent use in aggressive and humid environments.
The call station is designed for wall mounting. In cases where wall mounting is not possible, an optional stand column is available.

The weatherproof digital call station is PoE powered.

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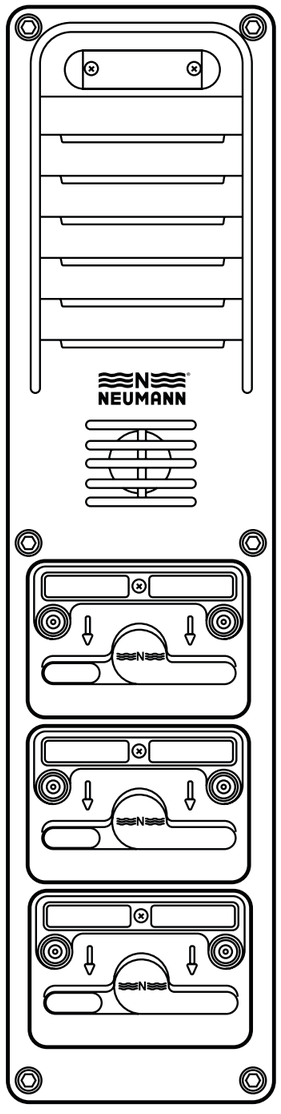

WFD IP
Call station,
3 double toggle
Art. no. 1 573 6

DS-6 WFD-IP
Weatherproof digital DS-6 IP call station

Art. no.	1 573 6
Mechanical data	
Weight	Approx. 6.5kg
Housing dimensions (HxWxD)	500mm x 120mm x 180mm
Housing colour	Pure orange (RAL 2004)
Material	Polyester, glass-fibre reinforced
Number of push buttons	6
Electrical data	
Nominal power consumption	5W
Maximum power consumption	15W
Frequency range	100Hz to 12kHz
Amplifier nominal power	1W
Connectivity	
Call station power supply	Via network connection 1: Power over Ethernet according to IEEE 802.3af Plug-in power supply: DC 24V -10/+ 15% Central power supply: 48V - 10/+15%
Ethernet interfaces	2
Ethernet protocol	IEEE 802.3u
Transmission protocol	Neumann DS-6 IP Protocol
Environmental conditions	
Temperature range	-20°C to +55°C
Protection class according to DIN EN 60529 or IEC 60529	IP66
Flammability of the enclosure	UL94 V-0

Accessories		
1 950 5	Stand column	For using the call station as a column
64 9 0109 031 3	Weatherproof sound absorbing hood	Sound absorption hood for outdoor use
64 9 0109 004 3	Sound absorption hood	Sound absorption hood for indoor use
22 2 1601 5605	Double toggle speech button	As spare part
21 2 1831 193 1	Blind insert	Instead of a double toggle speech button

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Weatherproof call stations

DS-6 WFDK IP
Weatherproof digital DS-6 IP compact call station

DS 6 · TIMM · PoE · ultra compact · redundant · serverless · High resistance · + more

https://neumann-elektronik.com/ds-6-wfdk-ip

- Compact design
- Full compatibility with DS-6 and TIMM system
- Remotely configurable and remotely monitorable by DS-6 / TIMM system
- Power supply via PoE interface
- Noise compensated electret microphone
- Integrated loudspeaker
- Redundant use
- Switchable volume reduction e.g. for night operation
- Optional industrial USB voice memory with alarm tones or announcements
- Subordinate circuit as standard
- Microphone sensitivity and integrated loudspeaker can be adjusted directly on location
- Line keys can be freely assigned as destination keys
- Service-friendly design
- Mounting is carried out after removing the housing cover through only 4 mounting holes in the basic housing
- Dust- and waterproof, glass-fibre reinforced polyester housing
- Low wiring requirements

The weatherproof digital IP compact call station enables direct intercom connections with other call stations and loudspeakers.

It is suitable for use indoors as well as outdoors and in harsh environments, e.g. in heavy industry operations.

The call station is designed for wall mounting. In cases where wall mounting is not possible, an optional stand column is available.

1 875 1

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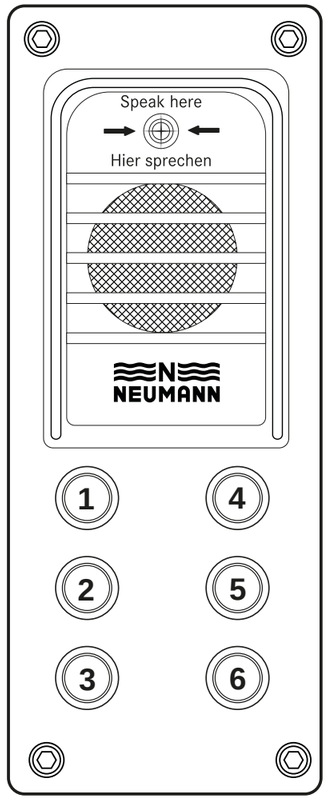

WFDK IP
Call station,
6 push buttons
Art. no. 1 875 1

DS-6 WFDK IP
Weatherproof digital DS-6 IP compact call station

Art. no.	**1 875 1**
Mechanical data	
Weight	**Approx. 2.5kg**
Housing dimensions (HxWxD)	**250mm x 100mm x 195mm**
Housing colour	**Pure orange (RAL 2004)**
Material	**Polyester, glass fibre reinforced**
Number of push buttons	**6**
Electrical data	
Nominal power consumption	**5W**
Maximum power consumption	**15W**
Frequency range	**100Hz to 12kHz**
Amplifier nominal power	**1W**
Connectivity	
Call station power supply	**Via network connection 1: Power over Ethernet according to IEEE 802.3af Plug-in power supply: DC 24V -10/+ 15% Central power supply: 48V - 10/+15%**
Ethernet interfaces	**2**
Ethernet protocol	**IEEE 802.3u**
Transmission protocol	**Neumann DS-6 IP Protocol**
Environmental conditions	
Temperature range	**-20°C to +55°C**
Protection class according to DIN EN 60529 or IEC 60529	**IP66**
Flammability of the enclosure	**UL94 V-0**

Accessories		
1 953 8	**Stand column**	**For using the call station as a column**
97 9 4413 561 9	**Hexagon spanner SW5**	**For hexagon socket screws on the housing cover**
22 9 3201 403 6	**Mounting kit**	**Mounting kit for call station attachment, incl. 2 mounting kits and 4 hexagonal bolts M6 x 12**
21 4 1143 005 1	**Industrial USB voice memory**	**For standard alarm tones or announcements**

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Weatherproof call stations

WFD U_{k0} EXPROOF
Weatherproof digital U_{k0} call station, Ex-proof

U_{k0} | UP TO 6 km | EMV Safe | fully metallized inserts | 2 Wire Technology | 7 kHz | 25W / 100Volt additional amplifier | + more

https://neumann-elektronik.com/wetterfeste-digitale-sprechstellen-uk0-exproof

- Full compatibility with DS-6 and TIMM system via Neumann DS-6 U_{k0} II Adapter
- Two-wire technology with 6km range
- Explosion protection through flameproof enclosure
- Fully metallised inner housing prevents electromagnetic incompatibility (EMC)
- Potential-free contact for controlling a flashing light or horn
- Noise-compensated electret microphone
- 25W / 100 volt additional amplifier[1)] solderless retrofittable on location
- Switchable volume reduction, e.g. for night operation
- EL operation with own additional loudspeaker[1)] as standard
- Switch-off of the additional loudspeaker[1)] after the first WL response as standard
- Line keys can be freely assigned as destination keys
- Dialling function with dialling pad, optionally usable as destination keys without illumination
- Temperature-controlled power limitation of the 25W additional amplifier[1)]
- Indication of busy and call signalling by LEDs
- Integrated loudspeaker designed as a horn loudspeaker system
- Subordinate circuit as standard
- Microphone sensitivity as well as integrated loudspeaker and 25W additional amplifier[1)] directly adjustable on location
- Double toggle speech buttons with opto-coupler, 2 lines each
- Cable gland for additional loudspeaker line as standard
- Service-friendly modular construction thanks to screw system
- Dial pad and double toggle speech buttons can be upgraded and replaced thanks to “plug & play”
- Generous connection space, two wires can be clamped per connection
- Mounting takes place after lifting the housing cover through only 4 mounting holes in the basic housing
- Dust- and waterproof, glass-fibre reinforced polyester housing
- Low wiring requirement

The weatherproof digital U_{k0} call station, Ex-proof, enables direct voice connections with other call stations and loudspeaker announcements in potentially explosive environments.

When the robust double toggle speech buttons are pressed, light barriers (opto-couplers) are activated without contact, which allows permanent use in aggressive, humid and also dusty environments, especially in areas enriched with explosive gases and dusts. For special applications, the call station can optionally be manufactured with a protective lacquer. Please contact us for more information.

The call stations are designed for wall mounting. In cases where wall mounting is not possible, an optional stand column is available.

The WFD U_{k0} EXPROOF call stations cannot be extended with additional housings.

1) Can be ordered optionally / may require an additional two-wire cable

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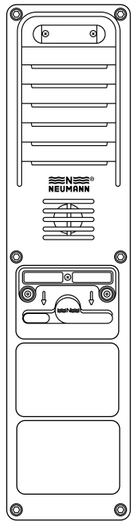
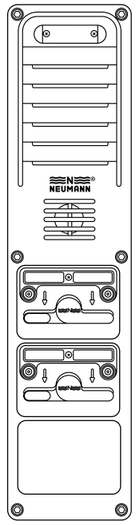


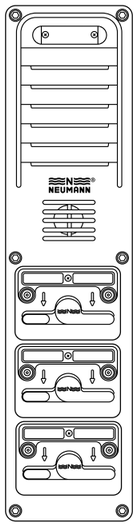
WFD U_{k0} EXPROOF
Call station,
1 Double toggle
Art. no. 1 564 6

With 25W additional amplifier
Art. no. 1 561 3



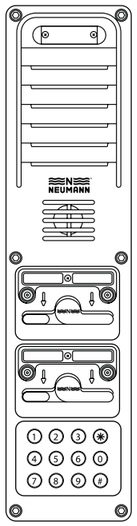
WFD U_{k0} EXPROOF
Call station,
2 Double toggle
Art. no. 1 565 7

With 25W additional amplifier
Art. no. 1 562 4



WFD U_{k0} EXPROOF
Call station,
3 Double toggle
Art. no. 1 563 5

With 25W additional amplifier
Art. no. 1 560 2



WFD U_{k0} EXPROOF
Call station,
2 Double toggle,
Dial pad
Art. no. 1 521 9

With 25W additional amplifier
Art. no. 1 522 0

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WFD U_{k0} EXPROOF
Weatherproof digital U_{k0} call station, Ex-proof

Art. no.	1 5XX X
Mechanical data	
Weight (without additional amplifier)	Approx. 6.5kg
Housing dimensions (HxWxD)	500mm x 120mm x 180mm
Housing colour	Pure orange (RAL 2004)
Material	Polyester, glass fibre reinforced
Number Talk buttons Dialling keypad	depending on version 2-6 0-1
Electrical data	
Nominal operating voltage	DC 48V
Max. Quiescent current	< 25mA
Max. Operating current	< 100mA
Potential-free changeover contact	DC 30V, 500mA
Frequency range	300Hz to 7kHz
Connectivity	
Call station power supply	Phantom power supply DC 48V
Transmission protocol	Neumann U_{k0} Protocol
Environmental conditions	
Temperature range	-20°C to +55°C
Burning behaviour of the housing	UL94 V-0 (3.2)
ATEX Type of protection gas	Ex II 2 G Ex db eb ib IIC T4
ATEX Type of protection dust	Ex II 3 D Ex tc IIIB T135°C
EU type examination certificate	PTB 01 ATEX 2070 X
IECEx Type of protection gas	IEC Ex db eb ib IIC T4
IECEx Type of protection dust	IEC Ex tc IIIB T135°C
IECEx Declaration of conformity	IECEx PTB 16.0036X

Accessories		
1 950 5	Stand column	For using the call station as a column
64 9 0109 031 3	Weatherproof sound absorbing hood	Sound absorption hood for outdoor use
64 9 0109 004 3	Sound absorption hood	Sound absorption hood for indoor use
21 2 3408 261 9	Protective cover small, V2A	Protective cover RAL 2004 Dimensions: 600mm x 300mm x 250mm
97 9 4413 561 9	Hexagon spanner SW5	For hexagon socket screws on the housing cover
22 9 0501 560 0	Mounting kit	Adapter for mounting holes of older call stations, incl. 2 mounting kits and 4 hexagonal bolts V2A M6 x 18
21 2 1831 193 1	Blind insert	Instead of a double toggle speech button
22 2 1601 560 5	Key insert	Instead of a dial pad
22 3 0101 681 4	Dial pad	Instead of a double toggle speech button
4 972 2	15 Watt Ex Loudspeaker	Explosion-proof horn loudspeaker
4 973 3	25 Watt Ex Loudspeaker	Explosion-proof horn loudspeaker
1 570 3	25 Watt Additional amplifier	25W / 100V Additional amplifier
3 334 3	DS-6 U_{k0} II Adapter	8-fold. The DS-6 U_{k0} II Adapter serves as an adapter or interface for connection of digital U_{k0} call stations to the DS-6 decentralised communication system.

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1 5XX X
1 6XX X

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Weatherproof call stations

WFD U_{k0}
Weatherproof digital U_{k0} call station

U_{k0} | UP TO 6 km | 2 Wire Technology | expandable | 25W / 100Volt additional amplifier | 7 kHz | | | High resistance | + more

https://neumann-elektronik.com/wetterfeste-digitale-uk0-sprechstellen-wfd-mplus

- Full compatibility with DS-6 and TIMM system via Neumann DS-6 U_{k0} II Adapter
- Expandable by 3 double toggle speech buttons via WFD add-on housing
- Two-wire technology with 6km range
- Noise compensated electret microphone
- 25W / 100 Volt additional amplifier[1)] solderless retrofittable on location
- Integrated loudspeaker
- Service-friendly design
- Dial pad and double toggle speech buttons can be easily upgraded and replaced thanks to “plug & play”
- Microphone sensitivity as well as integrated loudspeaker and 25W additional amplifier[1)] adjustable directly on location
- EL operation with own additional loudspeaker[1)] as standard
- Potential-free contact for controlling a flashing light or horn
- Double toggle speech button with opto-coupler, 2 lines each
- Generous connection space, two wires per connection can be clamped
- Line keys can be freely assigned as destination keys
- Dialling function with dial pad, can optionally be used as destination keys without illumination
- Temperature-controlled power limitation of the 25W-additional amplifier[1)]
- Indication of busy and call signalling by LEDs
- Mounting is carried out after removing the housing cover through only 4 mounting holes in the basic housing
- Subordinate circuit as standard
- Switchable volume reduction, e.g. for night operation
- Switch-off of the additional loudspeaker[1)] after the first WL-answer as a standard feature
- Cable gland for additional loudspeaker line standard
- Dust- and waterproof, glass-fibre reinforced polyester housing
- Low cable requirement

The weatherproof digital U_{k0} call station enables direct voice connections with other call stations and loudspeaker announcements outdoors and indoors in harsh environments, e.g. in heavy industry operations.

By pressing the robust double toggle speech buttons, light barriers (opto-couplers) are activated without contact, which allows permanent use in aggressive and humid environments.

The call station is designed for wall mounting. In cases where wall mounting is not possible, an optional stand column is available.

With the WFD add-on housing, it is possible to expand the Weatherproof digital U_{k0} call station with an additional 3 double toggle buttons.

1) Can be ordered optionally / may require an additional two-wire cable

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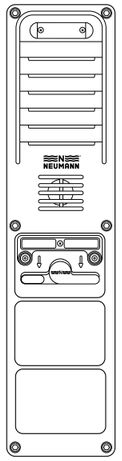
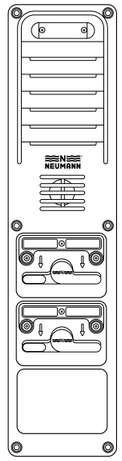


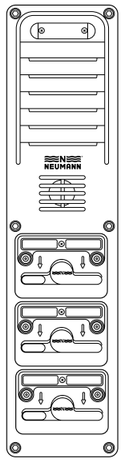
WFD U_{k0}
Call station,
1 Double toggle
Art. no. 1 593 8

With 25W additional amplifier
Art. no. 1 553 4



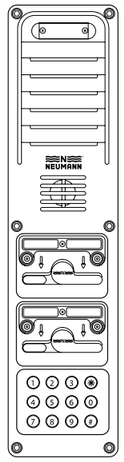
WFD U_{k0}
Call station,
2 Double toggle
Art. no. 1 594 9

With 25W additional amplifier
Art. no. 1 554 5



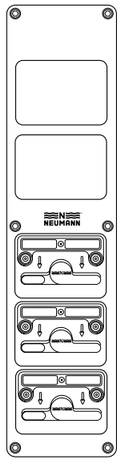
WFD U_{k0}
Call station,
3 Double toggle
Art. no. 1 595 0

With 25W additional amplifier
Art. no. 1 555 6



WFD U_{k0}
Call station,
2 Double toggle + Dial pad
Art. no. 1 681 6

With 25W additional amplifier
Art. no. 1 683 8



WFD
Weatherproof
Add-on housing,
3 Double toggle
Art. no. 1 630 0

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WFD U_{k0}
Weatherproof digital U_{k0} call station

Art. no.	1 5XX X - 1 6XX X	1 630 0 Add-on housing
Mechanical data		
Weight (without additional amplifier)	Approx. 6.5kg	Approx. 5kg
Housing dimensions (HxWxD)	500mm x 120mm x 180mm	
Housing colour	Pure orange (RAL 2004)	
Material	Polyester, glass fibre reinforced	
Number Talk buttons Dial pad	depending on version 2-6 0-1	 6 0
Electrical data		
Nominal operating voltage	DC 48V	
Max. Quiescent current	< 25mA	
Max. Operating current	< 100mA	
Potential-free changeover contact	DC 30V, 500mA	
Frequency range	300Hz to 7kHz	
Connectivity		
Call station power supply	Phantom power supply DC 48V	
Transmission protocol	Neumann U_{k0} Protocol	
Environmental conditions		
Temperature range	-30°C to +70°C	
Burning behaviour of the housing	UL94 V-0	
Protection class according to DIN EN 60529 or IEC 60529	IP66	

Accessories		
1 950 5	Stand column	For using the call station as a column
64 9 0109 031 3	Weatherproof sound absorbing hood	Sound absorption hood for outdoor use
64 9 0109 004 3	Sound absorption hood	Sound absorption hood for indoor use
21 2 3408 261 9	Protective cover small, V2A	Protective cover RAL 2004 Dimensions: 600mm x 300mm x 250mm
97 9 4413 561 9	Hexagon spanner SW5	For hexagon socket screws on the housing cover
22 9 0501 560 0	Mounting kit	Adapter for mounting holes of older call stations, incl. 2 mounting kits and 4 hexagonal bolts V2A M6 x 18
21 2 1831 193 1	Blind insert	Instead of a double toggle speech button
22 2 1601 560 5	Key insert	Instead of a dial pad
22 3 0101 681 4	Dial pad	Instead of a double toggle speech button
1 570 3	25 Watt Additional amplifier	25W / 100V Additional amplifier
3 334 3	DS-6 U_{k0} II Adapter	8-fold. The DS-6 U_{k0} Adapter II serves as an adapter or interface for the connection of digital U_{k0} call stations to the DS-6 decentralised communication system.

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1 5XX X

1 6XX X

The photos shown are for reference only, the actual product may differ.

Weatherproof call stations

WFD M+ U_{k0}
Weatherproof metallised digital U_{k0} call station

U_{k0} | UP TO 6 km | EMV Safe | 2 Wire Technology | fully metallized inserts | 7 kHz | 25W / 100Volt additional amplifier | High resistance | + more

https://neumann-elektronik.com/wetterfeste-digitale-uk0-sprechstellen-wfd-mplus

- Fully metallised inner housing prevents electromagnetic incompatibility (EMC)
- Full compatibility with DS-6 and TIMM system via Neumann DS-6 U_{k0} II Adapter
- Expandable by 3 double toggle speech buttons via WFD add-on housing
- Two-wire technology with 6km range
- Noise compensated electret microphone
- 25W / 100 Volt Additional amplifier[1)] solderless retrofittable on location
- Integrated loudspeaker
- Service-friendly design
- Dial pad and double toggle speech buttons can be easily upgraded and replaced thanks to “plug & play”
- Microphone sensitivity as well as integrated loudspeaker and 25W additional amplifier[1)] directly adjustable on location
- EL operation with own additional loudspeaker[1)] as standard
- Double toggle speech buttons with opto-coupler, 2 lines each
- Generous connection space, two wires per connection can be clamped
- Line keys can be freely assigned as destination keys
- Dialling function with dial pad, can optionally be used as push-buttons without illumination
- Potential-free contact for controlling a flashing light or horn
- Temperature-controlled power limitation of the 25W-additional amplifier[1)]
- Indication of busy and call signalling by LEDs
- Mounting is carried out after removing the housing cover through only 4 mounting holes in the basic housing
- Subordinate circuit as standard
- Switchable volume reduction, e.g. for night operation
- Switch-off of the additional loudspeaker[1)] after the first WL-answer as a standard feature
- Cable gland for additional loudspeaker line standard
- Dust- and waterproof, glass-fibre reinforced polyester housing
- Low cable requirement

The weatherproof digital metallised U_{k0} call station enables direct voice connections with other call stations and loudspeaker announcements outdoors and indoors in harsh environments, e.g. in heavy industry operations.

By pressing the robust double toggle speech buttons, light barriers (opto-couplers) are activated without contact, which allows permanent use in aggressive and humid environments.

The call station is designed for wall mounting. In cases where wall mounting is not possible, an optional stand column is available.

1) Can be ordered optionally / may require an additional two-wire cable

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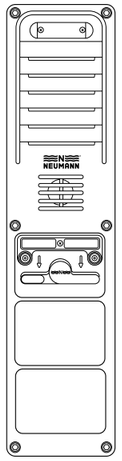
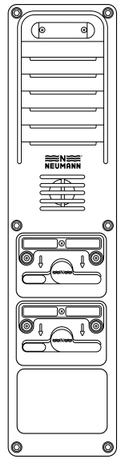


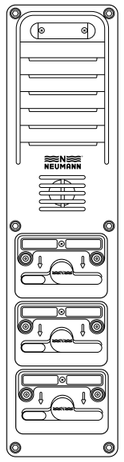
WFD M+ U_{k0}
Call station,
1 Double toggle
Art. no. 1 586 0

With 25W additional amplifier
Art. no. 1 556 7



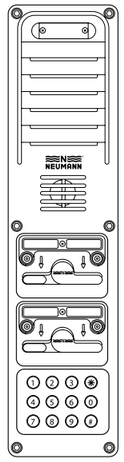
WFD M+ U_{k0}
Call station,
2 Double toggle
Art. no. 1 587 1

With 25W additional amplifier
Art. no. 1 557 8



WFD M+ U_{k0}
Call station,
3 Double toggle
Art. no. 1 596 1

With 25W additional amplifier
Art. no. 1 558 9



WFD M+ U_{k0}
Call station,
2 Double toggle + Dial pad
Art. no. 1 682 7

With 25W additional amplifier
Art. no. 1 684 9

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WFD M+ U_{k0}
Weatherproof metallised digital U_{k0} call station

Art. no.	1 5XX X - 1 6XX X
Mechanical data	
Weight (without additional amplifier)	Approx. 6.5kg
Housing dimensions (HxWxD)	500mm x 120mm x 180mm
Housing colour	Pure orange (RAL 2004)
Material	Polyester, glass fibre reinforced
Number Talk buttons Dial pad	depending on version 2-6 0-1
Electrical data	
Nominal operating voltage	DC 48V
Max. quiescent current	< 25mA
Max. operating current	< 100mA
Potential-free changeover contact	DC 30V, 500mA
Frequency range	300Hz to 7kHz
Connectivity	
Call station power supply	Phantom power supply DC 48V
Transmission protocol	Neumann U_{k0} Protocol
Environmental conditions	
Temperature range	-30°C to +70°C
Burning behaviour of the housing	UL94 V-0
Protection class according to DIN EN 60529 or IEC 60529	IP66

Accessories		
1 950 5	Stand column	For using the call station as a column
64 9 0109 031 3	Weatherproof sound absorbing hood	Sound absorption hood for outdoor use
64 9 0109 004 3	Sound absorption hood	Sound absorption hood for indoor use
21 2 3408 261 9	Protective cover small, V2A	Protective cover RAL 2004 Dimensions: 600mm x 300mm x 250mm
97 9 4413 561 9	Hexagon spanner SW5	For hexagon socket screws on the housing cover
22 9 0501 560 0	Mounting kit	Adapter for mounting holes of older call stations, incl. 2 mounting kits and 4 hexagonal bolts V2A M6 x 18
21 2 1831 193 1	Blind insert	Instead of a double toggle speech button
22 2 1601 560 5	Key insert	Instead of a dial pad
22 3 0101 681 4	Dial pad	Instead of a double toggle speech button
1 570 3	25 Watt Additional amplifier	25W / 100V Additional amplifier
3 334 3	DS-6 U_{k0} II Adapter	8-fold. The DS-6 U_{k0} Adapter I| serves as an adapter or interface for the connection of digital U_{k0} call stations to the DS-6 decentralised communication system.

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1 6XX X

The photos shown are for reference only, the actual product may differ.

Weatherproof call stations

WFD U_{p0}
Weatherproof digital U_{p0} call station

U_{p0} | UP TO 2 km | expandable | 2 Wire Technology | 7 kHz | 25W / 100Volt additional amplifier | High resistance | + more

https://neumann-elektronik.com/wfd-wetterfeste-digitale-up0-sprechstellen

- Full compatibility with DS-6 and TIMM system via Neumann U_{p0} Adapter
- Expandable by 5-10 double toggle speech buttons via WFD add-on housing
- Two-wire technology with 2km range
- Noise compensated electret microphone
- 25W / 100 Volt Additional amplifier[1)] solderless retrofittable on location
- Integrated loudspeaker
- Service-friendly design
- Dial pad and double toggle speech button can be easily upgraded and replaced thanks to “plug & play”
- Microphone sensitivity as well as integrated loudspeaker and 25W additional amplifier[1)] directly adjustable on location
- EL operation with own additional loudspeaker[1)] as standard
- Dust- and waterproof, glass-fibre reinforced polyester housing
- Double toggle speech button with opto-coupler, 2 lines each
- Generous connection space, two wires per connection can be clamped
- Line buttons can be freely assigned as destination buttons
- Dialling function with dial pad, can optionally be used as destination keys without illumination
- Temperature-controlled power limitation of the 25W-additional amplifier[1)]
- Potential-free contact for controlling a flash lamp or horn Indication of busy and call signalling by LEDs
- Mounting is carried out after removing the housing cover through only 4 mounting holes in the basic housing
- Subordinate circuit as standard
- Switchable volume reduction, e.g. for night operation
- Switch-off of the additional loudspeaker[1)] after the first WL-answer as a standard feature
- Cable gland for additional loudspeaker line standard
- Low cable requirement

The weatherproof digital U_{p0} call station enables direct voice connections with other call stations and loudspeaker announcements outdoors and indoors in harsh environments, e.g. in heavy industry operations.

Pressing the robust double toggle speech button activates light barriers (opto-couplers) without contact, which allows permanent use in aggressive and humid environments.

The call station is designed for wall mounting. In cases where wall mounting is not possible, an optional stand column is available.

The WFD add-on housing offers the possibility to expand the weatherproof digital U_{p0} call station with additional 5-10 double toggle buttons.

1) Can be ordered optionally / may require an additional two-wire cable

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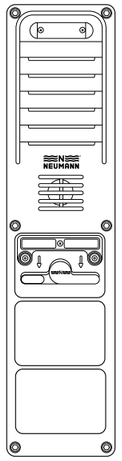
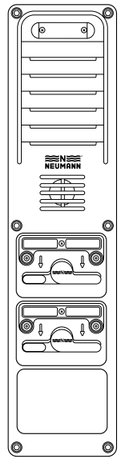


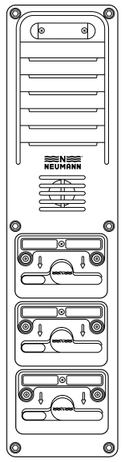
WFD
Weatherproof digital
U_{p0} Call station,
1 Double toggle
Art. no. 1 638 8

With 25W additional amplifier
Art. no. 1 635 5



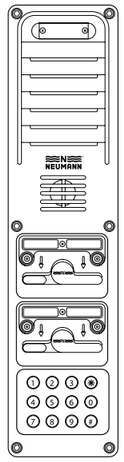
WFD
Weatherproof digital
U_{p0} Call station,
2 Double toggle
Art. no. 1 639 9

With 25W additional amplifier
Art. no. 1 636 6



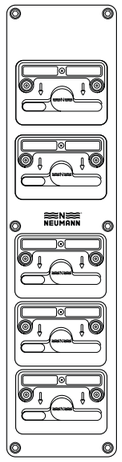
WFD
Weatherproof digital
U_{p0} Call station,
3 Double toggle
Art. no. 1 640 1

With 25W additional amplifier
Art. no. 1 637 7



WFD
Weatherproof digital
U_{p0} Call station,
2 Double toggle + Dial pad
Art. no. 1 632 2

With 25W additional amplifier
Art. no. 1 631 1



WFD
Weatherproof
Add-on housing,
5 Double toggle
Art. no. 1 620 9

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WFD U_{p0}
Weatherproof digital U_{p0} call station

Art. no.	1 6XX X	1 620 9 Add-on housing
Mechanical data		
Weight (without additional amplifier)	Approx. 6.5kg	Approx. 5kg
Housing dimensions (HxWxD)	500mm x 120mm x 180mm	
Housing colour	Pure orange (RAL 2004)	
Material	Polyester, glass fibre reinforced	
Number Talk buttons Dial pad	depending on version 2-6 0-1	 10 0
Electrical data		
Nominal operating voltage	DC 48V	
Max. quiescent current	< 25mA	
Max. operating current	< 100mA	
Potential-free changeover contact	DC 30V, 500mA	
Frequency range	300Hz to 7kHz	
Connectivity		
Call station power supply	Phantom power supply DC 48V	
Transmission protocol	Neumann U_{p0} Protocol	
Environmental conditions		
Temperature range	-30°C to +70°C	
Burning behaviour of the housing	UL94 V-0	
Protection class according to DIN EN 60529 or IEC 60529	IP66	

Accessories		
1 950 5	Stand column	For using the call station as a column
64 9 0109 031 3	Weatherproof sound absorbing hood	Sound absorption hood for outdoor use
64 9 0109 004 3	Sound absorption hood	Sound absorption hood for indoor use
21 2 3408 261 9	Protective cover small, V2A	Protective cover RAL 2004 Dimensions: 600mm x 300mm x 250mm
97 9 4413 561 9	Hexagon spanner SW5	For hexagon socket screws on the housing cover
22 9 0501 560 0	Mounting kit	Adapter for mounting holes of older call stations, incl. 2 mounting kits and 4 hexagonal bolts V2A M6 x 18
21 2 1831 193 1	Blind insert	Instead of a double toggle speech button
22 2 1601 560 5	Key insert	Instead of a dial pad
22 3 0101 681 4	Dial pad	Instead of a double toggle speech button
1 570 3	25 Watt Additional amplifier	25W / 100V Additional amplifier
3 338 7	DS-6 U_{p0} II Adapter	8-fold. The DS-6 U_{p0} Adapter II serves as an adapter or interface for the connection of digital U_{p0} call stations to the DS-6 decentralised communication system.

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1 5XX X

The photos shown are for reference only, the actual product may differ.

Weatherproof call stations

WFA EXPROOF
Weatherproof analogue call station, Ex-proof

analogue | EMV Safe | fully metallized inserts | High resistance | 25W / 100Volt additional amplifier | 10 kHz | IP66 | + more | Ex | IECEx

https://neumann-elektronik.com/wfa-exproof-wetterfeste-analoge-sprechstellen-ex-geschuetzt

- Fully metallised inner housing prevents electromagnetic incompatibility (EMC)
- Full compatibility with DS-6 and TIMM system via Neumann Analogue Adapter or analogue plug-in unit
- Noise compensated electret microphone
- 25W / 100Volt additional amplifier[1)] solderless retrofittable on location
- Integrated loudspeaker designed as a pressure chamber system
- Service-friendly modular construction thanks to screw system
- EX-protection due to flameproof enclosure
- Double toggle speech button can be upgraded and replaced thanks to “plug & play”
- Microphone sensitivity as well as integrated loudspeaker and 25W additional amplifier[1)] can be adjusted directly on location
- EL operation with own additional loudspeaker[1)] as standard
- Dust- and waterproof, glass-fibre reinforced polyester housing
- Double toggle speech button with opto-coupler, 2 lines each
- Generous connection space, two wires per connection can be clamped
- Line buttons can be freely assigned as destination buttons
- Temperature-controlled power limitation of the 25W-additional amplifier[1)]
- Potential-free contact for controlling a flashing lamp or horn
- Indication of busy and call signalling by LEDs
- Mounting is done after removing the housing cover through only 4 mounting holes in the basic housing
- Subordinate circuit as standard
- Switchable volume reduction, e.g. for night operation
- Switch-off of the additional loudspeaker[1)] after the first WL-answer as a standard feature
- Cable gland for additional loudspeaker line standard
- Low cable requirement

The weatherproof analogue call station, Ex-proof enables direct voice connections with other call stations and loudspeaker announcements in potentially explosive environments.

By pressing the robust double toggle speech button, light barriers (opto-couplers) are activated without contact, which allows permanent use in aggressive, damp and also dusty environments, especially in areas enriched with explosive gases and dusts.

The call station is designed for wall mounting. In cases where wall mounting is not possible, an optional stand column is available.

The WFA-EXPROOF weatherproof analogue call station cannot be extended with add-on housing.

The call station is particularly energy efficient.

1) Can be ordered optionally / may require an additional two-wire cable

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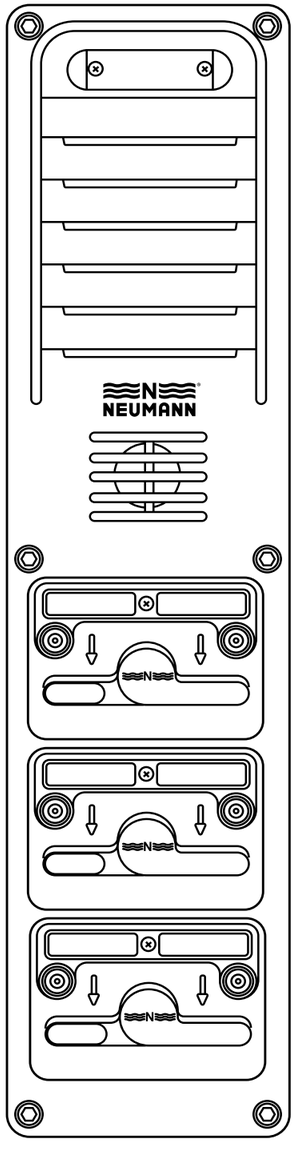
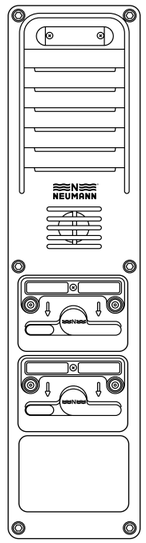


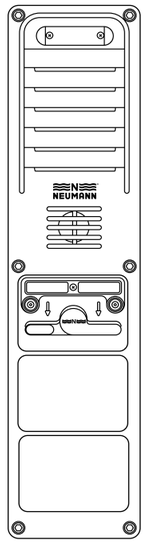
WFA EXPROOF
Weatherproof analogue
Call station, Ex-proof,
3 Double toggle
Art. no. 1 577 0

With 25W additional amplifier
Art. no. 1 580 4



WFA EXPROOF
Weatherproof analogue
Call station, Ex-proof,
2 Double toggle
Art. no. 1 576 9

With 25W additional amplifier
Art. no. 1 579 2



WFA EXPROOF
Weatherproof analogue
Call station, Ex-proof,
1 Double toggle
Art. no. 1 575 8

With 25W additional amplifier
Art. no. 1 578 1

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Technical data and product information may vary or be changed without prior notice.

WFA EXPROOF
Weatherproof analogue call station, Ex-proof

Art. no.	1 5XX X
Mechanical data	
Weight (without additional amplifier)	Approx. 6.5kg
Housing dimensions (HxWxD)	500mm x 120mm x 180mm
Housing colour	Pure orange (RAL 2004)
Material	Polyester, glass fibre reinforced
Number of push buttons	depending on version 2-6
Electrical data	
Nominal operating voltage	DC 48V
Max. quiescent current	< 10mA
Max. operating current	< 50mA
Potential-free changeover contact	DC 30V, 500mA
Frequency range	300Hz to 10kHz
Connectivity	
Call station power supply	Phantom power supply DC 48V
Transmission protocol	Analogue
Environmental conditions	
Temperature range	-20°C to +55°C
Burning behaviour of the housing	UL94 V-0 (3.2)
ATEX Type of protection gas	Ex II 2 G Ex db eb ib IIC T4
ATEX Type of protection dust	Ex II 3 D Ex tc IIIB T135°C
EU type examination certificate	PTB 01 ATEX 2070 X
IECEx Type of protection gas	IEC Ex db eb ib IIC T4
IECEx Type of protection dust	IEC Ex tc IIIB T135°C
IECEx Declaration of conformity	IECEx PTB 16.0036X

Accessories		
1 950 5	Stand column	For using the call station as a column
64 9 0109 031 3	Weatherproof sound absorbing hood	Sound absorption hood for outdoor use
64 9 0109 004 3	Sound absorption hood	Sound absorption hood for indoor use
21 2 3408 261 9	Protective cover small, V2A	Protective cover RAL 2004 Dimensions: 600mm x 300mm x 250mm
97 9 4413 561 9	Hexagon spanner SW5	For hexagon socket screws on the housing cover
22 9 0501 560 0	Mounting kit	Adapter for mounting holes of older call stations, incl. 2 mounting kits and 4 hexagonal bolts V2A M6 x 18
21 2 1831 193 1	Blind insert	Instead of a double toggle speech button
22 2 1601 560 5	Double toggle speech button	Instead of a blind insert
4 972 2	15 Watt Ex Loudspeaker	Explosion-proof horn loudspeaker
4 973 3	25 Watt Ex Loudspeaker	Explosion-proof horn loudspeaker
1 570 3	25 Watt Additional amplifier	25W / 100V Additional amplifier
2 390 4	DS-6 Plug-in unit, analogue	The DS-6 plug-in unit serves as an adapter / interface for the connection of an analogue call station.
3 331 0	DS-6 Analogue Adapter	8-fold. The DS-6 Analogue Adapter serves as an adapter or interface for the connection of up to eight analogue call stations to the decentralised communication system.

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1 5XX X

The photos shown are for reference only, the actual product may differ.

Weatherproof call stations

WFA
Weatherproof analogue call station

analogue | High resistance | 25W / 100Volt additional amplifier | 10 kHz | IP66 | modular | + more

https://neumann-elektronik.com/wfa-wetterfeste-analoge-sprechstelle

- Full compatibility with DS-6 and TIMM system via Neumann Analogue Adapter or analogue plug-in unit
- Noise compensated electret microphone
- 25W / 100 Volt additional amplifier[1)] solderless retrofittable on location
- Integrated loudspeaker
- Service-friendly design
- Double toggle speech button can be easily upgraded and replaced thanks to “plug & play”
- Microphone sensitivity as well as integrated loudspeaker and 25W additional amplifier[1)] directly adjustable on location
- EL operation with own additional loudspeaker[1)] as standard
- Dust- and waterproof, glass-fibre reinforced polyester housing
- Double toggle speech button with opto-coupler, 2 lines each
- Generous connection space, two wires per connection can be clamped
- Line buttons can be freely assigned as destination buttons
- Temperature-controlled power limitation of the 25W-additional amplifier[1)]
- Potential-free contact for controlling a flashing lamp or horn
- Indication of busy and call signalling by LEDs
- Mounting is done after removing the housing cover through only 4 mounting holes in the basic housing
- Subordinate circuit as standard
- Switchable volume reduction, e.g. for night operation
- Switch-off of the additional loudspeaker[1)] after the first WL-answer as a standard feature
- Cable gland for additional loudspeaker line standard
- Low cable requirement

The weatherproof analogue call station enables direct voice connections with other call stations and loudspeaker announcements in harsh environments.

When the robust double toggle speech button is pressed, light barriers (opto-couplers) are activated without contact, which allows permanent use in aggressive, damp and even dusty environments.

Replacement / retrofitting of the double toggle speech button can also be carried out without a service technician on location.

The call station is designed for wall mounting. In cases where wall mounting is not possible, an optional stand column is available.

The WFA Call station cannot be extended with add-on housing.

The WFA call stations are particularly energy-efficient.

1) Can be ordered optionally / may require an additional two-wire cable

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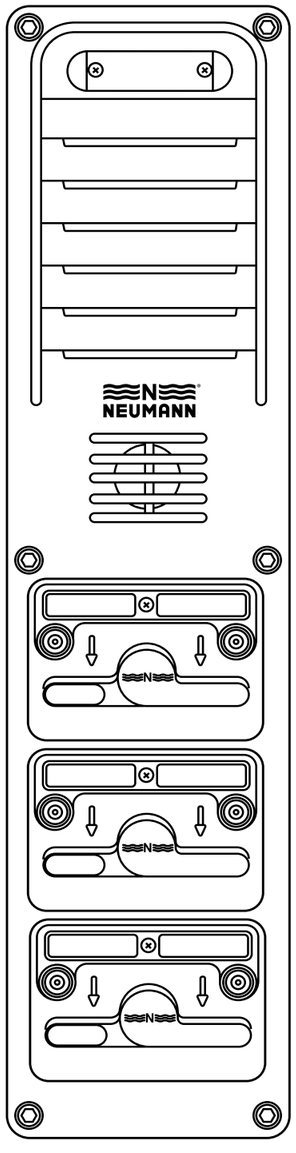
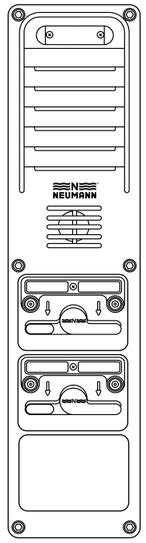


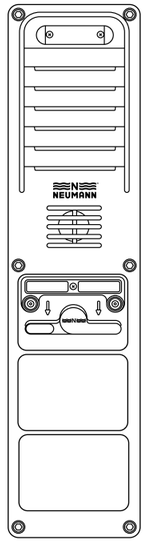
WFA Call station,
3 Double toggle
Art. no. 1 590 5

With 25W additional amplifier
Art. no. 1 538 7



WFA Call station,
2 Double toggle
Art. no. 1 589 3

With 25W additional amplifier
Art. no. 1 537 6



WFA Call station,
1 Double toggle
Art. no. 1 588 2

With 25W additional amplifier
Art. no. 1 536 5

WFA
Weatherproof analogue call station

Art. no.	1 5XX X
Mechanical data	
Weight (without additional amplifier)	Approx. 6.5kg
Housing dimensions (HxWxD)	500mm x 120mm x 180mm
Housing colour	Pure orange (RAL 2004)
Material	Polyester, glass fibre reinforced
Number of push buttons	depending on version 2-6
Electrical data	
Nominal operating voltage	DC 48V
Max. Quiescent current	< 10mA
Max. Operating current	< 50mA
Potential-free changeover contact	DC 30V, 500mA
Frequency range	300Hz to 10kHz
Connectivity	
Call station power supply	Phantom power supply DC 48V
Transmission protocol	Analogue
Environmental conditions	
Temperature range	-30°C to +70°C
Burning behaviour of the housing	UL94 V-0 (3.2)
Protection class according to DIN EN 60529 or IEC 60529	IP66

Accessories		
1 950 5	Stand column	For using the call station as a column
64 9 0109 031 3	Weatherproof sound absorbing hood	Sound absorption hood for outdoor use
64 9 0109 004 3	Sound absorption hood	Sound absorption hood for indoor use
21 2 3408 261 9	Protective cover small, V2A	Protective cover RAL 2004 Dimensions: 600mm x 300mm x 250mm
97 9 4413 561 9	Hexagon spanner SW5	For hexagon socket screws on the housing cover
22 9 0501 560 0	Mounting kit	Adapter for mounting holes of older call stations, incl. 2 mounting kits and 4 hexagonal bolts V2A M6 x 18
21 2 1831 193 1	Blind insert	Instead of a double toggle speech button
22 2 1601 560 5	Double toggle speech button	Instead of a Blind insert
4 972 2	15 Watt Ex Loudspeaker	Explosion-proof horn loudspeaker
4 973 3	25 Watt Ex Loudspeaker	Explosion-proof horn loudspeaker
1 570 3	25 Watt Additional amplifier	25W / 100V Additional amplifier
2 390 4	DS-6 Plug-in unit, analogue	The DS-6 plug-in unit serves as an adapter / interface for the connection of an analogue call station.
3 331 0	DS-6 Analogue Adapter	8-fold. The DS-6 Analogue Adapter serves as an adapter or interface for connecting up to eight analogue call stations to the DS-6 decentralised communication system.

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1 9XX X

The photos shown are for reference only, the actual product may differ.

Weatherproof call stations

WFAK
Weatherproof analogue compact call station

analogue | ultra compact | IP65 | 10 kHz | High resistance | + more

https://neumann-elektronik.com/wetterfeste-analoge-sprechstelle-kompakt-wfak

- Compact design
- Expandable with add-on housing
- Full compatibility with DS-6 and TIMM system via Neumann Analogue Adapter or analogue plug-in module
- Noise compensated electret microphone
- Integrated loudspeaker
- Service-friendly design
- Microphone sensitivity and integrated loudspeaker directly adjustable on location
- Dust- and waterproof, glass-fibre reinforced polyester housing
- Line keys can be freely assigned as destination keys
- Indication of busy and call signalling by LEDs
- Mounting is done after removing the housing cover through only 4 mounting holes in the basic housing
- Subordinate switching as standard
- Switchable volume reduction, e.g. for night operation
- Low cable requirement

The weatherproof analogue compact call station enables direct voice connections with other call stations and loudspeaker announcements.

They are suitable for use indoors as well as outdoors and in harsh environments, e.g. in heavy industry operations.

The WFAK compact call station, as well as the WFAK add-on housing, are designed for wall mounting and are available in orange and yellow.

In cases where wall mounting is not possible, an optional stand column is available.
The WFAK compact call station and WFAK add-on housing can be flanged together and thus offer 9 line keys in the smallest possible space.

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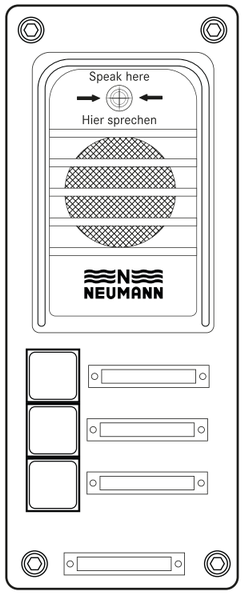
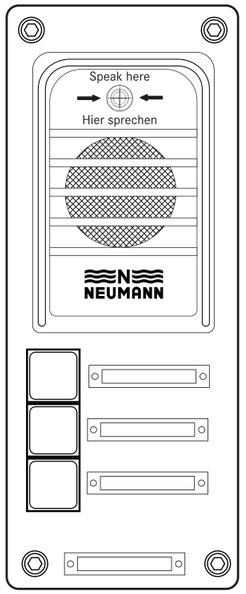
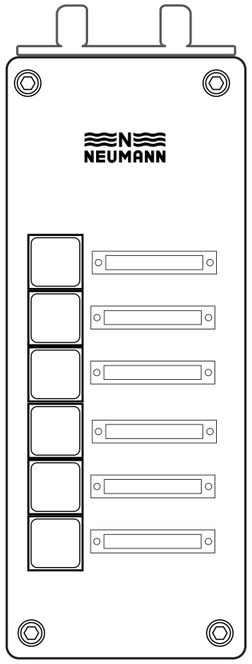


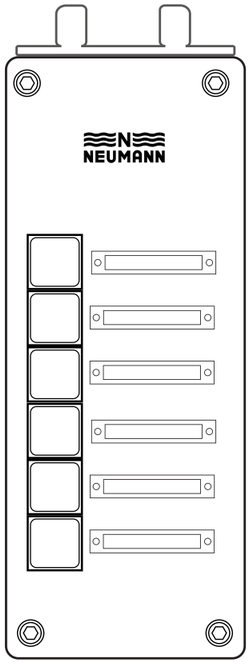
WFAK
Call station, orange
3 line keys
Art. no. 1 960 6



WFAK
Call station, gelb
3 line keys
Art. no. 1 970 7



WFAK
Add-on housing, orange
6 line keys
Art. no. 1 967 3



WFAK
Add-on housing, yellow
6 line keys
Art. no. 1 977 4

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WFAK
Weatherproof analogue compact call station

Art. no.	1 9XX X Call station	1 9XX X Add-on housing
Mechanical data		
Weight	Approx. 2.3kg	Approx. 2.5kg
Housing dimensions (HxWxD)	250mm x 100mm x 195mm	
Housing colour	Pure orange (RAL 2004) / Golden yellow (RAL 1004)	
Material	Polyester, glass fibre reinforced	
Number of illuminated buttons	3 push-to-talk buttons, each for one line	6 push-to-talk buttons, each for one line
Electrical data		
Nominal operating voltage	DC 24V / DC 48V / DC 60V	
Max. Quiescent current	21mA / 27mA / 30mA	
Max. Operating current	185mA / 205mA / 210mA	
Potential-free changeover contact	DC 30V, 500mA	
Frequency range	300Hz to 10kHz	
Connectivity		
Call station power supply	Phantom power supply DC 48V	
Transmission protocol	Analogue	
Environmental conditions		
Temperature range	-30°C to +70°C	
Burning behaviour of the housing	UL94 V-0	
Protection class according to DIN EN 60529 or IEC 60529	IP65	

Accessories		
1 953 8	Stand column, Pure orange (RAL 2004)	For using the call station as a column
1 952 7	Stand column, Golden yellow (RAL 1004)	For using the call station as a column
97 9 4413 561 9	Hexagon spanner SW5	For hexagon socket screws on the housing cover
22 9 3201 403 6	Mounting kit	Mounting kit for call station attachment, incl. 2 mounting kits and 4 hexagonal bolts M6 x 12
2 390 4	DS-6 Plug-in unit, analogue	The DS-6 plug-in unit serves as an adapter / interface for the connection of an analogue call station.
3 331 0	DS-6 Analogue Adapter	8-fold. The DS-6 Analogue Adapter serves as an adapter or interface for connecting up to eight analogue call stations to the DS-6 decentralised communication system.

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1 156 3 - 01

The photos shown are for reference only, the actual product may differ.

Weatherproof call stations

DS-22 DKS SIP
Digital full duplex DS-22 SIP crane call station

DS 22 | SIP | half / full duplex | Wireless Network | 8Ω Broadband loudspeaker | 12 kHz | Text memory | IP65 | + more

- Full compatibility with DS-22 system
- Remotely configurable and remotely monitorable by DS-22 system
- Half / full duplex compatibility
- Internal voice memory
- External WLAN access point powered by the call station (PoE)
- Distances over several 100m possible
- Exchangeable keycaps
- Integrated full range loudspeaker 4W, 8Ω
- Integrated power supply with 230V input voltage
- Four quick release fasteners for easy mounting
- Flexible gooseneck electret microphone
- Flexible mounting options
- 16 illuminated push buttons (line buttons)

The crane call station with external WLAN is used in communication systems.

It is connected via wireless LAN to an access point as a ground station and enables direct voice connections with other call stations (half / full duplex), loudspeaker announcements and also programmable local functions. The crane call station has 16 line keys. Two standards are available for the WLAN connection, IEEE 802.11a/b/g/h/i and IEEE 802.11n, each with two different frequency bands, 2.4GHz and 5GHz.

The crane station has - in addition to the destination buttons for WL/EL - a volume control and an internal voice memory.

The scope of delivery of the call station includes a mounting plate with quick-release fasteners for easy installation on the crane operator‘s seat in the crane cabin. However, the call station can also be used as a wall-mounted station by turning the mounting plate backwards.

A WLAN access client is required for operation, which, like its required antennas, is not included in the scope of delivery. The WLAN access client is to be mounted outside the crane station in the crane cabin. The WLAN access client offers the possibility of connecting up to three antennas, which are to be mounted outside the crane cab.

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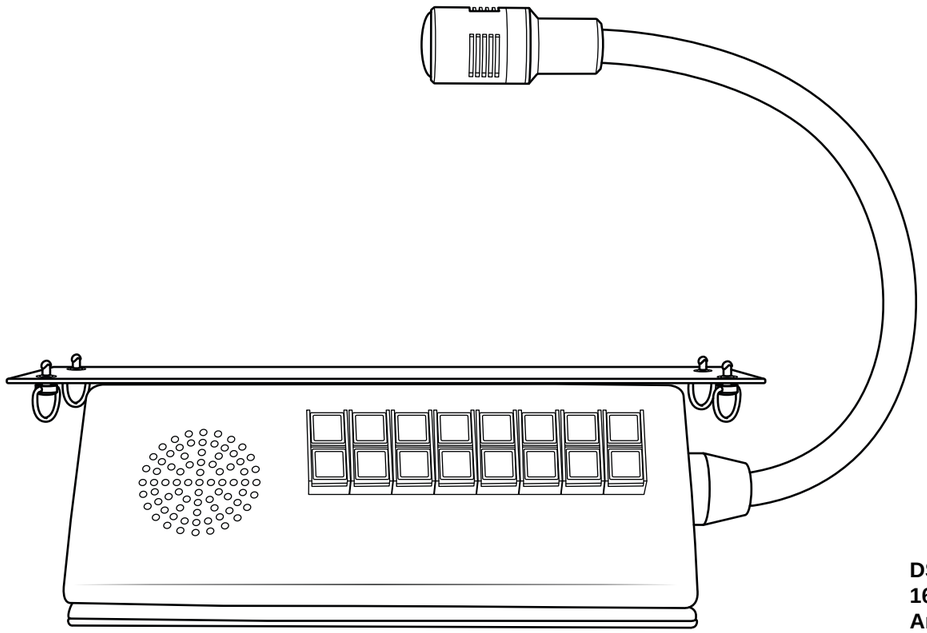
DS-22 DKS SIP
Digital full duplex DS-22 SIP crane call station



DS-22 DKS SIP
16 push buttons
Art. no. 1 573 6

Art. no.	1 156 3 - 01
Mechanical data	
Weight	Approx. 5kg
Housing dimensions (HxWxD)	270mm x 194mm x 90mm (without gooseneck and without mounting plate)
Housing colour	Orange (RAL 2004) smooth finish
Material	
Number of push buttons	16
Electrical data	
Nominal power consumption	5W
Maximum power consumption	10W
Frequency range	100Hz to 12kHz
Connectivity	
Call station power supply	Integrated power supply unit with 230V / 50Hz input voltage
Ethernet interfaces	2
Ethernet protocol	IEEE 802.3u
WLAN Standard	IEEE 802.11 a/b/g/h/i (2,4GHz and 5GHz)
Range (depending on the antenna used, frequency range and data rate)	≥ 100m
Transmission protocol	Neumann DS-22 IP / SIP Protocol
Environmental conditions	
Temperature range	0°C to +55°C
Protection class according to DIN EN 60529 or IEC 60529	IP65

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DS-22 DKS SIP
Digital full duplex DS-22 SIP crane call station

Accessories

91 9 1116 946 7	Indoor WLAN access client / point according to IEEE 802.11 a/b/g/h/n equipped with two radio modules. For use in the crane cabin and/or as a ground station for the frequency bands 2.4GHz and 5GHz. Protection class: IP30
91 9 1116 945 6	Outdoor WLAN access client / point according to IEEE 802.11 a/b/g/h/n. Use in the crane cabin and/or as ground station for the frequency bands 2.4GHz and 5GHz. Protection class: IP65/67
94 9 1412 102 3	Power supply unit for supplying the WLAN access client / point for mounting rail installation (only suitable for indoor use)
94 9 1412 103 4	Power supply unit for supplying the WLAN access client / point for mounting rail installation. (for outdoor use, the unit must be housed in a weatherproof enclosure)
91 9 1150 019 6	Omni-directional rod antenna for outdoor use. Frequency band: 5GHz
91 9 1150 018 5	Omni-directional rod antenna for outdoor use. Frequency band: 2.4GHz
99 9 1980 263 6	3m antenna connection cable.
91 9 1111 446 7	LED lamp, white
92 9 1216 026 8	Key cap, clear
22 3 0101 156 1	Bracket for crane call station
99 9 1980 240 1	2m power supply cable with moulded connector 7/8“ and screw cap, IP67
99 9 1980 241 2	5m power supply cable with moulded connector 7/8“ and screw cap, IP67
99 9 1980 242 3	10m power supply cable with moulded connector 7/8“ and screw cap, IP67
99 9 1980 245 6	2m network connection with moulded plugs, M12 coupling on one side, IP67
99 9 1980 246 7	5m network connection with moulded plugs, M12 coupling on one side, IP67
99 9 1980 247 8	10m network connection with moulded plugs, M12 coupling on one side, IP67
98 9 310 7041 2	Access locking ring
98 9 310 7042 3	Hanger handle with quick release fastener
98 9 310 7040 1	Access Shock Absorber
92 9 1216 022 4	Lamp puller
92 9 1215 051 5	Key cap puller

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1 6XX X

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Weatherproof call stations

DS-22 WFD-SIP
Weatherproof digital full duplex DS-22 SIP call station with / without integrated 25W / 100V amplifier

DS 22 | SIP | half / full duplex | PoE | IP66 | modular | 8Ω Broadband loudspeaker | High resistance | + more

- Full compatibility with DS-22 system
- Remotely configurable and remotely monitorable by DS-22 system
- Half / full duplex compatibility
- Integrated horn loudspeaker for best speech intelligibility
- Monitored electret microphone with electronic noise compensation and dynamic compression
- With or without integrated 25W amplifier for connection of loudspeakers in 100V technology
- Call station power supply via the first four-pair Ethernet interface with PoE Class 8
- Two Ethernet interfaces
- Cable glands for additional devices, e.g. loudspeaker and flashing light, as standard
- Line keys can be freely assigned as destination keys
- Connection option for monitoring loudspeaker
- Status messages indicated by LEDs
- Remotely configurable and remotely monitorable via network
- Dust- and waterproof glass-fibre reinforced polyester housing
- Three freely labeled double toggle speech buttons with opto-couplers, each for two lines
- LEDs for status indication, such as call and busy signalling
- Mounting is done after lifting the housing cover through 4 mounting holes in the basic housing
- Adjustment of microphone level and loudspeaker volume
- Potential-free relay contact for connection of a flashing light or horn
- Subordinate circuit as standard
- Switchable volume reduction, e.g. for night operation
- Temperature-controlled power limitation of the amplifier for additional loudspeakers in 100V technology
- Hand microphone, foot switch and headset can be connected
- Add-on housing can be connected to extend the number of line keys (10-20 additional targets)
- Optional connection of headset, additional microphone and/or foot switch

The weatherproof digital SIP call station, with optional integrated amplifier, enables direct voice connections with other call stations (half / full duplex) and loudspeakers, as well as through the optional integrated amplifier.
amplifier, it can also be used for direct announcement via loudspeakers in 100V technology.

It is suitable for use indoors as well as outdoors and in harsh environments, e.g. in heavy industry plants.

Due to the integrated amplifier, the call station is powered with four-pair PoE Class 8.

Pressing the robust double toggle speech button activates the non-contact light barrier (opto-coupler) is activated, which allows permanent use in aggressive and humid environments.

The call station is designed for wall mounting. In cases where wall mounting is not possible, an optional stand column is available.

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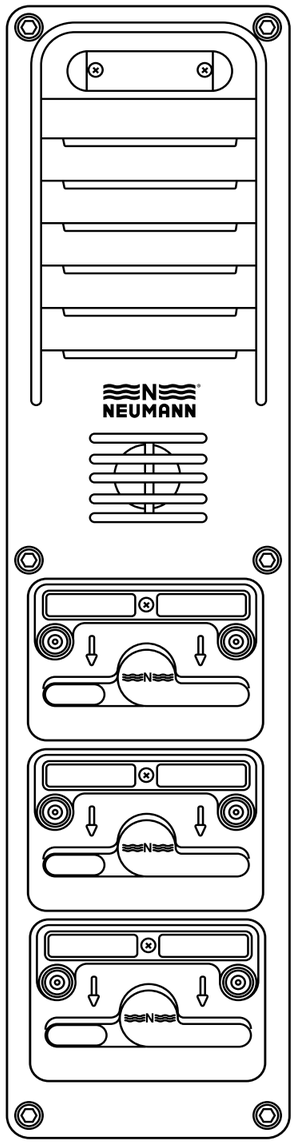
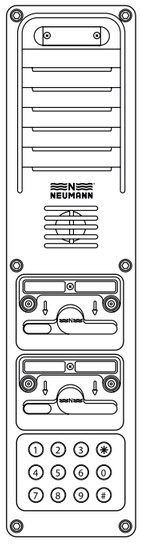


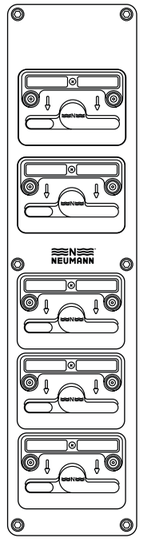
DS-22 WFD-SIP
3 Double toggle
Art. no. 1 663 6

With 25W Additional amplifier
Art. no. 1 666 9



DS-22 WFD-SIP
2 Double toggle+ Dial pad
Art. no. 1 669 2

With 25W Additional amplifier
Art. no. 1 670 4



WFD
Add-on housing
5 Double toggle
Art. no. 1 620 9

DS-22 WFD-SIP
Weatherproof digital full duplex DS-22 SIP call station with / without integrated 25W / 100V amplifier

Art. no.	1 6XX X Call station	1 620 9 Add-on housing
Mechanical data		
Weight	Approx. 5.5kg	Approx. 4kg
Housing dimensions (HxWxD)	500mm x 120mm x 180mm	
Housing colour	Pure orange (RAL 2004)	
Material	Polyester, glass fibre reinforced	
Number Talk buttons Dial pad	4-6 1	10
Electrical data		
Nominal power consumption in call station mode	20W	
Maximum power consumption in announcement mode	90W	
Frequency range	100Hz to 12kHz	
Amplifier nominal power internal loudspeaker	5W	
Amplifier nominal power external loudspeaker	30W / 330Ω (100V)	
Potential-free relay contact	DC 60V, 1A, 60W (Ohmic load)	
Maximum power consumption of the DC 24V flashing light	15W	
Connectivity		
Call station power supply	Network four-pair PoE according to IEEE 802.3bt Class 8 Local DC 48V, min. 3A (DC 36V ... DC 57V)	
Ethernet interfaces	2	
Ethernet protocol	IEEE 802.3u	
Transmission protocol	Neumann DS-22 IP / SIP Protocol	
Environmental conditions		
Temperature range	-20°C to +55°C / 70°C	
Protection class according to DIN EN 60529 or IEC 60529	IP66	
Flammability of the enclosure	UL94 V-0	

Accessories		
1 950 5	Stand column	For using the call station as a column
64 9 0109 031 3	Weatherproof sound absorbing hood	Sound absorption hood for outdoor use
64 9 0109 004 3	Sound absorption hood	Sound absorption hood for indoor use
21 2 3408 261 9	Protective cover small, V2A	Protective cover RAL 2004 Dimensions: 600mm x 300mm x 250mm
22 9 0501 560 0	Mounting kit	Adapter for mounting holes of older call stations, incl. 2 mounting kits and 4 hexagonal bolts V2A M6 x 18
97 9 4413 561 9	Hexagon spanner SW5	For hexagon socket screws on the housing cover
22 3 0101 681 4	Dial pad	Instead of a double toggle speech button
21 2 1831 193 1	Blind insert	Instead of a double toggle speech button

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1 69X X

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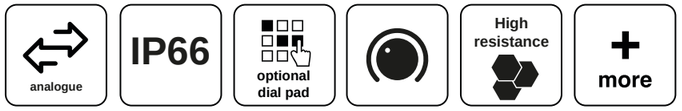
Weatherproof telephone

With (WTAT) or without keyboard (WTA)



- Glass-fibre reinforced polyester housing
- Metal keypad with ice protection made of V4A[2)]
- Keypad with 21 keys with ABC labelling[2)]
- 2-line alphanumeric display with pictograms
- Equipment for vertical wall mounting
- Handset with integrated, adjustable anti-roll protection
- Steel-armoured armoured cord made of V4A
- Dynamic hearing capsule with stray field coil for inductive coupling of hearing aids
- Electret microphone
- Noise suppression > 3dB by means of integrated speech funnel
- W-wire: Connection option for an external second alarm clock
- Connection clamps for an external loudspeaker
- Connection clamps for headset (optional accessory)[1) 2)]
- Connection clamps for second receiver (optional accessory)[1) 2)]
- Connection clamps up to 4mm² rigid and up to 2.2mm² flexible

Performance features WTAT:

- Handset operation, open listening, hands-free operation
- Phone book
- Setting the dialling procedure
- Setting the AKZ pause
- Setting the flash time
- Setting the volume
- Callback key
- Lock / PIN code
- Setting the LCD contrast
- Entering welcome text
- Selecting from 5 menu languages

Performance features Central power supply version (WTA)

- Line seizure by lifting the handset
- Ringer by means of integrated call organ

Developed for connection to the public network and private branch exchanges, the weatherproof, analogue telephone (WTAT) is a reliable, modern means of communication, even under the highest mechanical stress.

The robust, impact-resistant housing with a V4A steel keypad suitable for work gloves guarantees maximum functional reliability under adverse environmental conditions, such as high humidity, dust or contact with alkalis or lubricants.

The simple, intuitive operation, uncomplicated programming and the easy-to-read alphanumeric display offer maximum convenience.Designed as a telephone for central operation, the WTA corresponds to the WTAT except for the keypad and display.

1) A headset or a second handset can be connected, but not both at the same time.
2) Except Central power supply version (WTA)

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Weatherproof telephone

With (WTAT) or without keyboard (WTA)

Art. no.	1 698 4 / WTAT	1 699 5 / WTA
Mechanical data		
Weight	Approx. 5,5kg	
Housing dimensions (HxWxD)	260mm x 228mm x 135 mm	
Housing colour	Black-anthracite	
Material	Glass fibre reinforced polyester	
Display	2-line display approx. 78 x 26mm	no
Number Talk buttons Dial pad	 1x V4A steel keypad	 no
Electrical data		
Operating voltage range	DC 24-66V	
Power supply	DC 15mA – 100mA	
Frequency range	100Hz to 12kHz	
Ringing AC voltage	AC 24V to 90V (at 21-54Hz Call frequency) AC 30V to 90V (at 16,6-54Hz Call frequency)	
Ringer impedance	> 6kΩ at 25Hz and AC 24-90V > 6kΩ at 25Hz and AC 24-90V	
Environmental conditions		
Climate class according to DIN EN 60721-3-3	3K6	
Protection class according to DIN EN 60529, or IEC 60529	IP66	
Degree of protection against mechanical stress	IK 09 according to EN 50102	
Ex approval 06 ATEX E 028 according to EC-RL 94/9/EC	-	
Operating temperature	-25°C to +60°C (Below 20°C no indication in the display)	
Storage temperature	-25°C to +70°C according to IEC 60721	

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1 69X X

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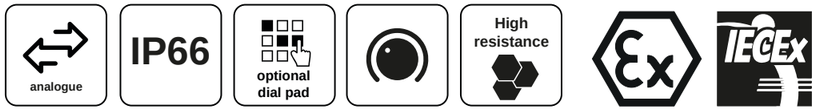
Explosion-proof telephone

With (WTAT) or without keyboard (WTA)



- Glass-fibre reinforced polyester housing
- Metal keypad with ice protection made of V4A[2)]
- Keypad with 21 keys with ABC labelling[2)]
- 2-line alphanumeric display with pictograms
- Potting encapsulation
- Equipment for vertical wall mounting
- Handset with integrated, adjustable anti-roll protection
- Steel-armoured armoured cord made of V4A
- Dynamic hearing capsule with stray field coil for inductive coupling of hearing aids
- Electret microphone
- Noise suppression > 3dB by means of integrated speech funnel
- W-wire: Connection option for an external second alarm clock
- Connection clamps for an external loudspeaker
- Connection clamps for headset (optional accessory)[1) 2)]
- Connection clamps for second receiver (optional accessory)[1) 2)]
- Connection clamps up to 4mm² rigid and up to 2.2mm² flexible

Performance features WTAT:

- Handset operation, open listening, hands-free operation
- Phone book
- Setting the dialling procedure
- Setting the AKZ pause
- Setting the flash time
- Setting the volume
- Callback key
- Lock / PIN code
- Setting the LCD contrast
- Entering welcome text
- Selecting from 5 menu languages

Performance features Central power supply version (WTA)

- Line seizure by lifting the handset
- Ringer by means of integrated call organ

Developed for connection to the public network and private branch exchanges, the weatherproof, analogue telephone (WTAT) is a reliable, modern means of communication, even under the highest mechanical stress.

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Explosion-proof telephone

With (WTAT) or without keyboard (WTA)

Art. no.	1 696 2 / WTAT-Ex	1 697 3 / WTA-Ex
Mechanical data		
Weight	Approx. 5,5kg	
Housing dimensions (HxWxD)	260mm x 228mm x 135 mm	
Housing colour	Black-anthracite	
Material	Glass fibre reinforced polyester	
Display	2-line display approx. 78 x 26mm	no
Number Talk buttons Dial pad	 1x V4A steel keypad	 no
Electrical data		
Operating voltage range	DC 24-66V	
Power supply	DC 15mA – 100mA	
Frequency range	100Hz to 12kHz	
Ringing AC voltage	AC 24V to 90V (at 21-54Hz Call frequency) AC 30V to 90V (at 16,6-54Hz Call frequency)	
Ringer impedance	> 6kΩ at 25Hz and AC 24-90V > 6kΩ at 25Hz and AC 24-90V	
Environmental conditions		
Climate class according to DIN EN 60721-3-3	3K6	
Protection class according to DIN EN 60529, or IEC 60529	IP66	
Degree of protection against mechanical stress	IK 09 according to EN 50102	
Ex approval 06 ATEX E 028 according to EC-RL 94/9/EC	II 2G EEx em ib IIC T5 II 2D IP66 T100°C [3)] II 2G EEx em ib IIC T6 II 2D IP66 T80°C [4)]	
Operating temperature	-25°C to +60°C (for T5) -25°C to +40°C (for T6) (Below 20°C no indication in the display)	
Storage temperature	-25°C to +70°C according to IEC 60721	

3) Prerequisite for T5: ambient temperature between -25°C and +40°C
4) Prerequisite for T6: ambient temperature between -25°C and +40°C

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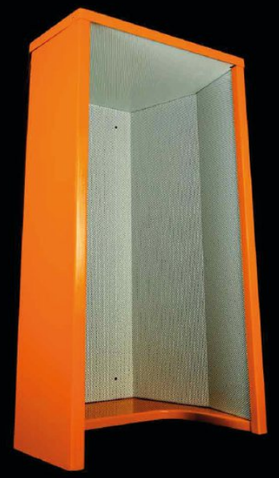
Accessories Weatherproof call stations



Weatherproof sound-absorbing bonnet,
Plastic, RAL 2004 (other colours available)
Dimensions (HxWxD): 985mm x 580mm x 500mm
Art. no.: 989 3114 399 6

Weatherproof sound-absorbing bonnet,
GPR, RAL 2004 (other colours available)
Dimensions (HxWxD): 985mm x 600mm x 510mm
Art. no.: 989 3114 389 6

Weatherproof sound absorption bonnet,
Galvanised sheet steel, RAL 2004(other colours available)
Dimensions (HxWxD): 980mm x 585mm x 480mm
Art.-No.: 989 3114 397 4

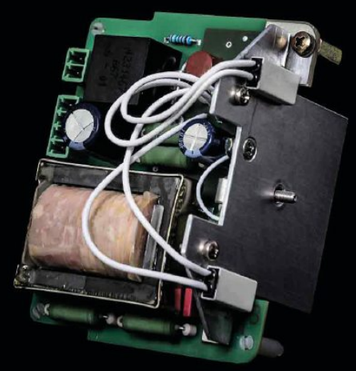
Protective cover small, V2A, RAL 2004
Dimensions: 600mm x 300mm x 250mm
Art. no.: 212 3408 261 9

Pedestal, For using the call station as a pedestal
Art. no.: 1 950 5

The photos shown are for reference only, the actual product may differ.

Headset with PTT button
Art.-No.: 212 1130 008 8

Ex flashing beacon DC 48V, yellow
Art. no.: 919 3210 318 7
(other mechanical versions available with different colours and supply voltages available)



Additional amplifier for WF EX 25W / 100VA
Art. no.: 1 570 3

Foot switch 1-pedal with accident protection cap and integrated change-over contact
Art. no.: 929 1230 341 4

Inlays as spare parts
Blind insert
Art. no.: 212 1831 193 1
Art. no.: 613 1831 007 0 (metallised)

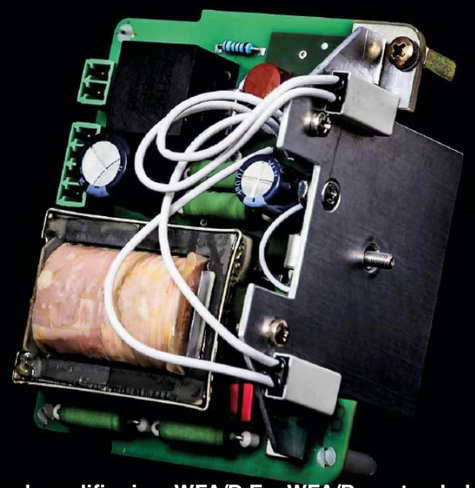
Double toggle intercom buttons
Art. no.: 221 1201 572 4
Art. no.: 222 1601 560 5 (metallised)

Dial keypad
Art. no.: 223 0101 681 4
Art. no.: 223 1701 560 7 (metallised)

The photos shown are for reference only, the actual product may differ.

Auxiliary amplifier

Auxiliary amplifier EX 25W / 100V (50V)



- Can be used as an additional amplifier in a WFA/D Ex, WFA/D or stand-alone unit
- Can be retrofitted on site without soldering
- Temperature-controlled power limitation
- 100V operation
- EL operation with own additional loudspeaker
- Disconnection of the additional loudspeaker

In call station mode in conjunction with an additional amplifier and loudspeaker, the additional loudspeaker can take over the function of a call loudspeaker.

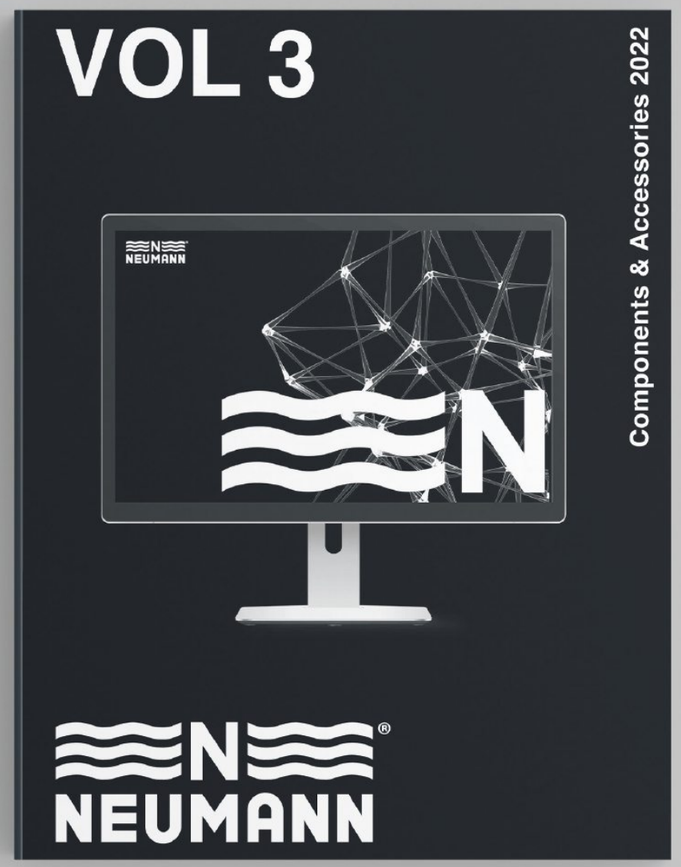
In this case, only the first call to the call station is transmitted by the auxiliary loudspeaker. Calls after a call station response are then automatically transmitted only via the call station loudspeaker. After a pause of approx. 20 seconds, this function returns to its original state.

Service	
101 5704	Mounting 25W additional amplifier

Art. no.	1 570 3
Electrical data	
Operating voltage	DC 48...60V
Max. Quiescent current	10mA
Output power	25W at 400Ω
Output voltage	100V (convertible to 50V)
Min. input voltage for nominal power	1V
Input resistance	20kΩ (at 1kHz)
Frequency range (measured at Ua=25 V AC)	200Hz to 10kHz (-3 to ±1dB)
Distortion factor (measured at Ua=70 V AC)	≤ 5%

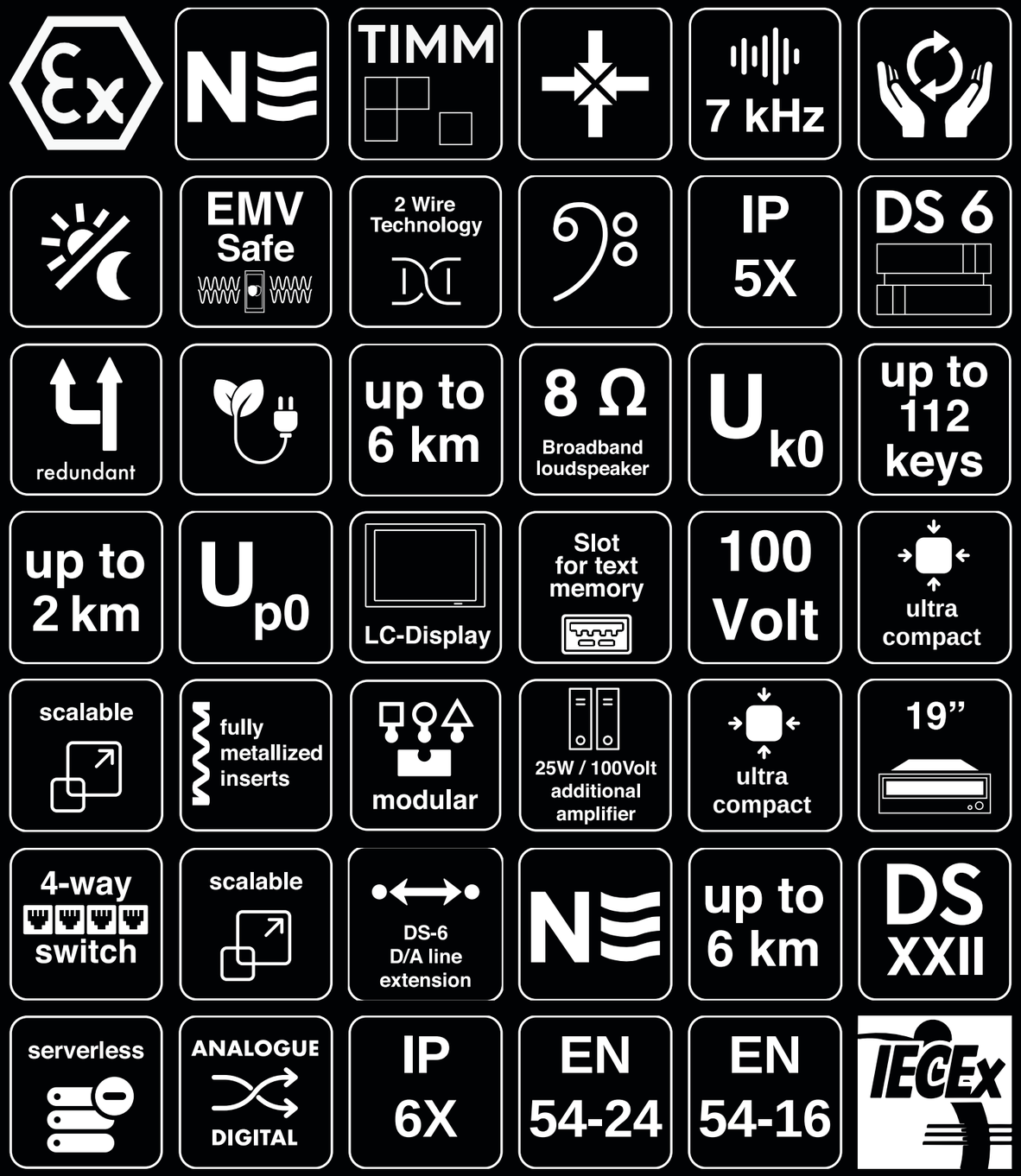
1 570 3

The photos shown are for reference only, the actual product may differ.



Further accessories and components can be found in Vol 3

https://neumann-elektronik.com/vol-3-en.pdf



The technology in detail

The technology in detail

IP protection classes

According to DIN 40 050 / IEC / VDE 0470 / EN 60529.

The degrees of protection are identified by internationally valid abbreviations: a two-digit IP code number (International Protection) indicates the degree of protection of the enclosure against the ingress of foreign bodies, dust and water.

Example of a code number: IP65[1].

First IP code number	Protection levels for contact and foreign body protection	Second IP code number	Degrees of protection for water protection
0	Unprotected	0	Unprotected
1	Protected against the penetration of large foreign bodies with a diameter greater than 50mm.	1	Protected against the penetration of vertically falling dripping water
2	Protected against the penetration of medi-um-sized foreign bodies with a diameter greater than 12mm	2	Protected against dripping water falling at an angle of up to 15° from the vertical.
3	Protected against the penetration of small foreign bodies with a diameter greater than 2.5mm.	3	Protected against water spray falling at any angle up to 60° from vertical
4	Protected against the penetration of tools, wires (granular foreign bodies) with a diameter greater than 1.0mm.	4	Protected against water splashing against the equipment from all directions.
5	Complete protection against contact with live or internal moving parts. Protection against harmful dust deposits. The ingress of dust is not com-pletely prevented, but the dust must not penetrate in such quantities that the function is impaired.	5	Protected against water jets from a nozzle di-rected against the equipment from all directions.
6	Complete protection against contact with live or internal moving parts. Protection against ingress of dust.	6	Protected against strong jets of water or tempo-rary flooding
		7	Protected against temporary immersion in water, under the specified pressure/time conditions of 0.15-m
		8	Protected against permanent immersion in water
		9K	Protected against water directed against the en-closure from any direction under high pressure/ steam jet cleaning

1) If no IP degree of protection is specified, the letter X replaces the respective digit, e.g. IPX4.

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The technology in detail

General information on the marking of explosion-protected equipment

The marking of electrical equipment and protective systems intended for use in potentially explosive atmospheres is carried out in accordance with the requirements of EC Directive 2014/34/EU.

Example of labelling: Ex II 2G Ex db ib IIC T4

Explanation of this example

Ex	Ex sign
II	Device group II
2	Device category 2 (open-pit)
G	Gases/vapours, suitable for zone 1 and 2
Ex	Explosion protection according to EN IEC 60079-0 ff
db	Pressure-proof enclosure Ex d
ib	Intrinsic safety Ex i
IIC	Explosion group (open pit, subgroup C)
T4	Temperature classification

Explanation of explosion protection:

1. Zones / Unit group / Unit category

There are 2 equipment groups: for underground use the number “I” is assigned, above ground the number “II”. Hazardous explosive atmospheres are divided into zones or according to the degree of probability of the occurrence of an explosive atmosphere. Equipment of the corresponding equipment category (area of use) must be used in the respective zones. In the current IEC regulation, the zones are defined as follows:

Classification of the Ex-areas / equipment category / equipment group

Combustible substances	Behaviour of the combustible substances	Zones	Equipment group (use above ground or underground)	Device category
G: Gases, mists, vapours	Are present constantly, for a long time or frequently	Zone 0	II	1G
	Occasionally occur	Zone 1	II	2G (also 1G)
	Probably do not occur, if they do, only rarely or briefly	Zone 2	II	3G (also 2G and 1G)
D: Dust	Are present constantly, for a long time or frequently	Zone 20	II	1D
	Occasionally occur	Zone 21	II	2D (also 1D)
	Probably not occur due to whirled-up dust, if only rarely or for a short time	Zone 22	II	3D (also 2D and 1D
M: Methane / Dust	-	Mining	I	M1
	-			M2 or M1

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The technology in detail

General information on the marking of explosion-protected equipment

Explosion subgroup : Classification of gases and vapours

Equipment group “II” is divided into three gas groups, with IIA being the least flammable and IIC the most flammable. In the USA there is a different division according to “Classes” (I, II, II): “Class I” refers to gases and vapours (see table).

Explosive subgroup / Representative vapours

CENELEC / IEC	Representative vapours	U.S.A. and Canada
I	Methane	No assignment
IIA	Propane, n-Butane, Kerosene	Class I, Group D
IIB	Ethylene, Hydrogen sulphide, Ethyl ether	Class I, Group C
IIC	Hydrogen, Ethine (Acetylene), Carbon disulphide	Class I, Group B
IIC	Hydrogen, Ethine (acetylene), Carbon disulphide	Class I, Group A

2. Explosion protection

In order for electrical equipment to be used safely in potentially explosive atmospheres, explosion protection techniques must be taken to prevent ignition of the atmosphere. This can be prevented with different techniques, depending on the application and the equipment: Separation (o, q, m), exclusion (p), confinement (d), special mechanical design (n, e), energy limitation (ia, ib), and other measures (s). Each of these techniques is subject to national and or international standards and regulations.

Ex: Explosion protection certified according to CENELEC standard EN60079...Explosion protection certified according to CENELEC standard EN60079...complies with the applicable EN standards and contains safety measures for equipment that ensure at least the equivalent safety compared to the European standards.

Type of protection / Technology / Standards

Labelling	Ignition protection type	Technology	CENELEC	IEC	DIN
	General requirements for all methods		EN60079-0	IEC60079-0	DIN EN60079-0
Ex d	Flameproof enclosure	Transmission of an explosion to the outside is excluded	EN60079-1	IEC60079-1	DIN EN60079-1
Ex e	Increased security	Special mechanical design	EN60079-7	IEC60079-7	DIN EN60079-7
Ex p	Pressurised enclosure	E atmosphere is separated from the ignition source	EN60079-2	IEC60079-2	DIN EN60079-2
Ex m	Potting enclosure		EN60079-18	IEC60079-18	DIN EN60079-18
Ex o	Oil enclosure		EN60079-6	IEC60079-6	DIN EN60079-6
Ex q	Sandkapselung		EN60079-5	IEC60079-5	DIN EN60079-5
Ex n	Without sparking (nA) / vapour-proof enclosure (nR)	Special mechanical design (only for zone 2 or 22)	EN60079-15	IEC60079-15	DIN EN60079-15
Ex i	Intrinsic safety	Spark energy limitation	EN60079-11	IEC60079-11	DIN EN60079-11
Ex s	Special protection	Measures other than the standardised types of protection			

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The technology in detail

General information on the marking of explosion-protected equipment

4. Classification of the temperature classes

Gas-air mixtures can be ignited not only by sparks but also by contact with hot surfaces. If the surface temperature of a piece of equipment reaches the ignition temperature of the explosive atmosphere, ignition can occur. For this reason, all electrical equipment used in potentially explosive atmospheres is divided into temperature classes.

Temperature classification		
	Permissible surface temperature of the electrical equipment in °C	Permissible surface temperature of the units in °C
T1	> 450°C	450°C
T2	> 300°C … ≤ 450°C	300°C
T3	> 200°C … ≤ 300°C	200°C
T4	> 135°C … ≤ 200°C	135°C
T5	> 100°C … ≤ 135°C	100°C
T6	> 85°C … ≤ 100°C	85°C

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