

smart ————— robust ————— proven

Mirror and Camera Monitor Systems for Special Vehicles



MEKRA Lang - passion for excellence.

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Mirror and camera monitor systems for special vehicles

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Dear Readers,

as part of the management team of the Lang group, it is my pleasure to present to you our new catalog for defense vehicles.

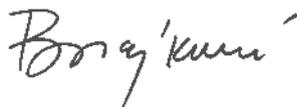
By putting every effort into developing solutions that provide optimum visibility around your vehicles, we dedicate our expertise and special diligence to benefiting our customers. We are guided by our firm belief that the critical requirement for ensuring all-around safety is to provide all-around visibility. This is an insight we have gained through our more than 30 years of experience as a provider of vision systems. The defense vehicle sector, which in many ways poses the most stringent and typically the most demanding challenges for our products, has always been our special focus.

With this catalog, we would like to provide you with suggestions for identifying the vision and safety solutions which are best suited for your specific applications. We are fully aware that the field of defense vehicles and related technologies is continuously undergoing tremendous changes. Not only are vehicles getting more complex, larger and more expensive, they are also being used in increasingly specialized applications. So we do not just want to propose solutions, but also listen to you to determine how we can provide you with the best strategy for meeting your needs.

As one of the leading suppliers of mirror and camera monitor systems for defense vehicle industry, we will most certainly find the ideal solution for you. With our expertise in both areas (mirrors as well as camera monitor systems), we are in a position to offer you the most advantageous benefit. This catalog also presents numerous innovations we have been able to develop by focusing our decades of experience and expertise on the specific needs of our customers in the defense industry. We offer: a wide range of products for your individual requirements, personal and expert on-site consultation, reliable installation service and sustainable customer support and efficient field service support.

It is our hope that our suggestions will exceed your expectations. We are committed to give our best.

With best regards,



Vladimir Brajkovic
Business Unit Director Electronics, Off-road & Specialty vehicles



Vladimir Brajkovic

Highlights

Mirror and mounting systems

Electrically or manually adjustable modular mirror

- Continuous field of vision from close proximity to horizon
- Obstacles and persons are detectable in close proximity
- Reduces risk of injuries and property damage
- Prevents costly down-times
- Ensures efficient operations



For a detailed description, please see page 26

Quick-change system

Wedge mounts

- Without tools
- Robust
- Stainless



Direct contacting with VGN-plug

- Watertight and dustproof
- Vibration resistant



For a detailed description, please see page 36

Comparison Digital Camera and Black and White Camera

	Digital Camera	Black and White Camera
Sensor resolution:	1024 x 768	752 x 582
Sensor type:	CMOS	CCD
Power consumption:	10V to 32V	10V to 32V
Operating temperature:	-30 °C to +49 °C	-20 °C to +30 °C
Storage temperature:	-40 °C to +71 °C	-25 °C to +71 °C
Output signal:	Digital APIX	Analog PAL
Image refresh rate:	25 Hz (full screen)	50 Hz (half screen)
Aperture angle:	60°	100°
Minimum illumination:	< 1 lux	< 0,3 lux



For a detailed description, please see page 41

7" monitor for up to 4 cameras

- Splashproof (IP65)
- Integrated control unit (ECU)
- Vehicle signal detection
- Intuitive menu navigation
- Individual settings are pre-programmable



For a detailed description, please see page 42

Development Competence

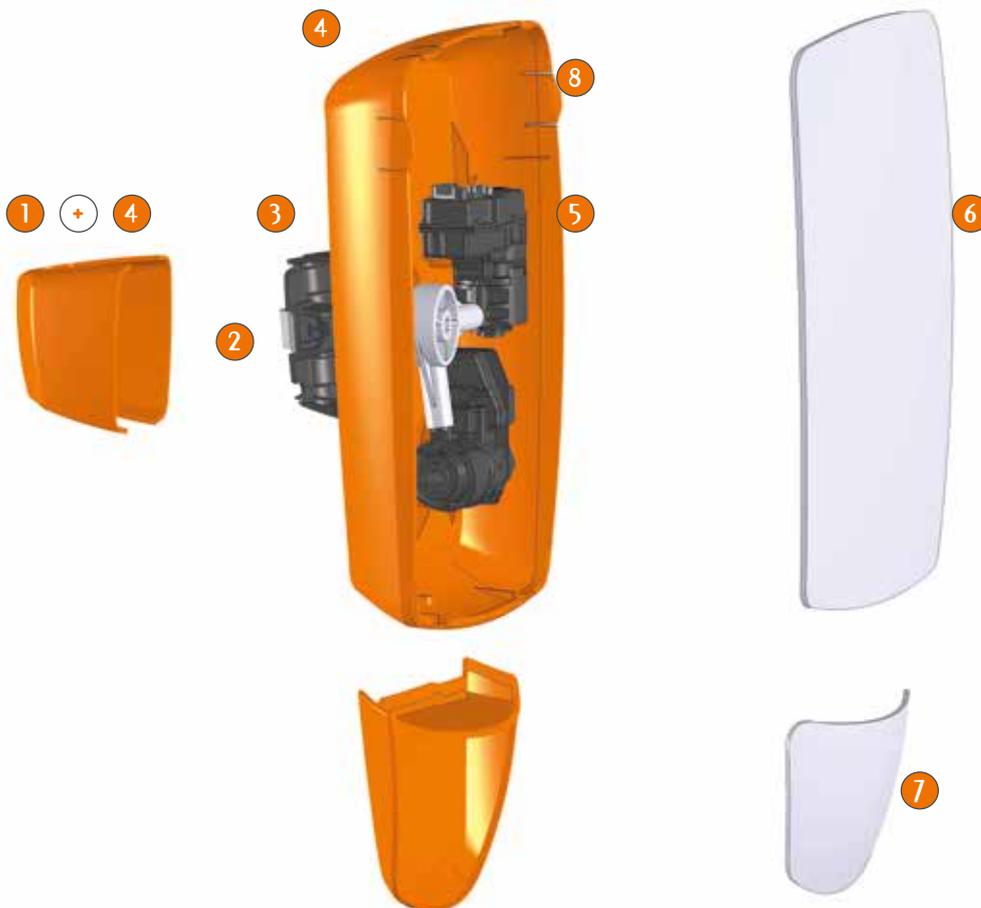
Newly developed mirror for an expanded field of vision

Example of a universal MEKRA mirror system: modular mirror

When we compare the field of vision created by the newly developed MEKRA modular mirror (on the left) to that of a traditional standard mirror (on the right), it is quite obvious that the MEKRA modular mirror provides an extended close-proximity view of the area directly next to the vehicle which is not covered by the traditional mirror.



<p>1 Modern design: - hidden screws and wiring</p>	<p>4 Rugged housing: - shock-proof - UV resistant</p>	<p>7 OPTIONAL: Wide-angle mirror: Glass radius: 300 mm or close-proximity mirror: Glass radius: 240 mm</p>
<p>2 Metal clamp: - hard joint - various tube diameter options (18 to 22 mm) - vertical and horizontal attachment options</p>	<p>5 Two actuators: - proven for heavy duty applications - safe operation even under extreme conditions - very robust</p>	
<p>3 Robust adjustment mechanism: - proven for construction machinery</p>	<p>6 Main mirror: glass radius: 1200 mm</p>	<p>8 Efficient use of installation space - large glass component - virtually no obstruction of direct view</p>



Development Competence

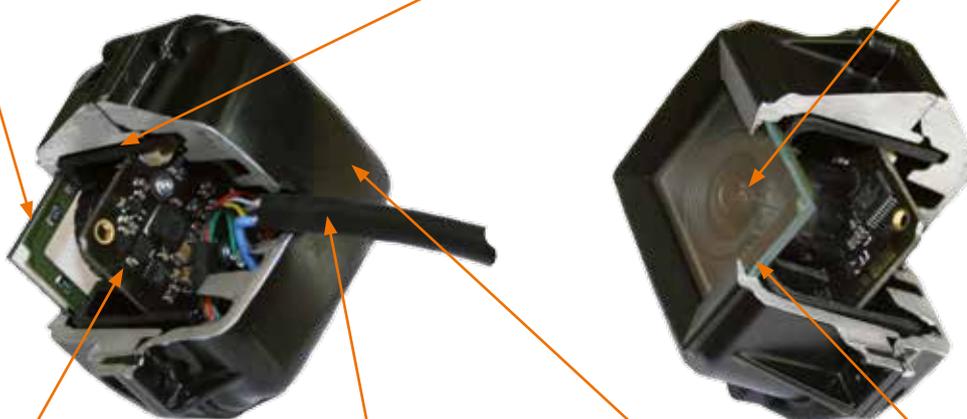
Electronics expertise

Construction and constituent parts of a MEKRA CMOS color camera

Heating system keeps the protective glass plate from fogging or icing up

Seal provides protection against dust, dirt and moisture

Enables low-distortion image



Camera electronics including image sensor and micro controller can be directly connected to 12V and 24V on-board power supply

Rugged connection cable designed to prevent kinks and pinching

Die-cast aluminium housing protects electronics from mechanical stresses

Glass protects lens against damage

Examples of different mounting options for MEKRA CMOS color cameras



MCB-3003



MCB-3000



MCB-3001



MCB-5002



MCB-5004

Development Competence

Overview of current regulations

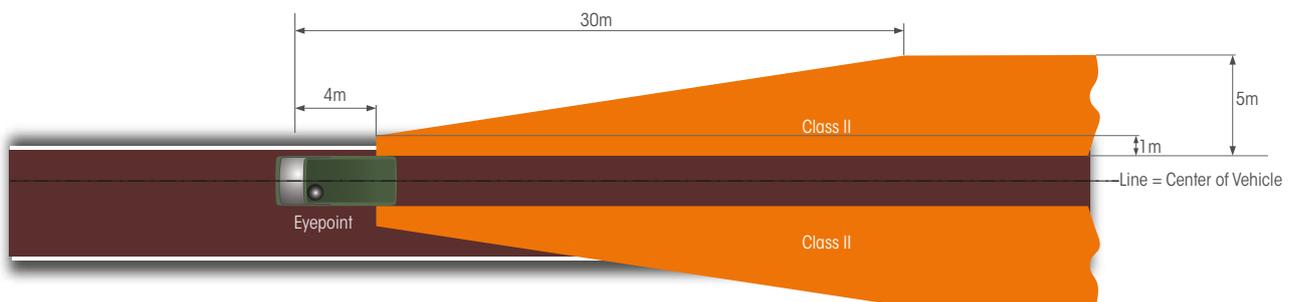


Close-proximity mirror field-of-vision requirements

The European Norm ECE R46 governs all safety-relevant provisions for all visible areas around vehicles and is decisive for any vehicle's legal road-traffic approval.

Since 1980 we have been system supplier for mirror systems in the field of commercial vehicles and thus have a long-lasting experience and know-how in this field. By means of a three-dimensional analysis of the fields of vision the required mirror systems are defined and in cooperation with our customers we develop individually adjusted mirror system for the respective vehicles.

Based on our experience and expertise and by using professional software we created mirror systems which not only confirm with the current legal provisions but provide best possible direct vision to the driver.

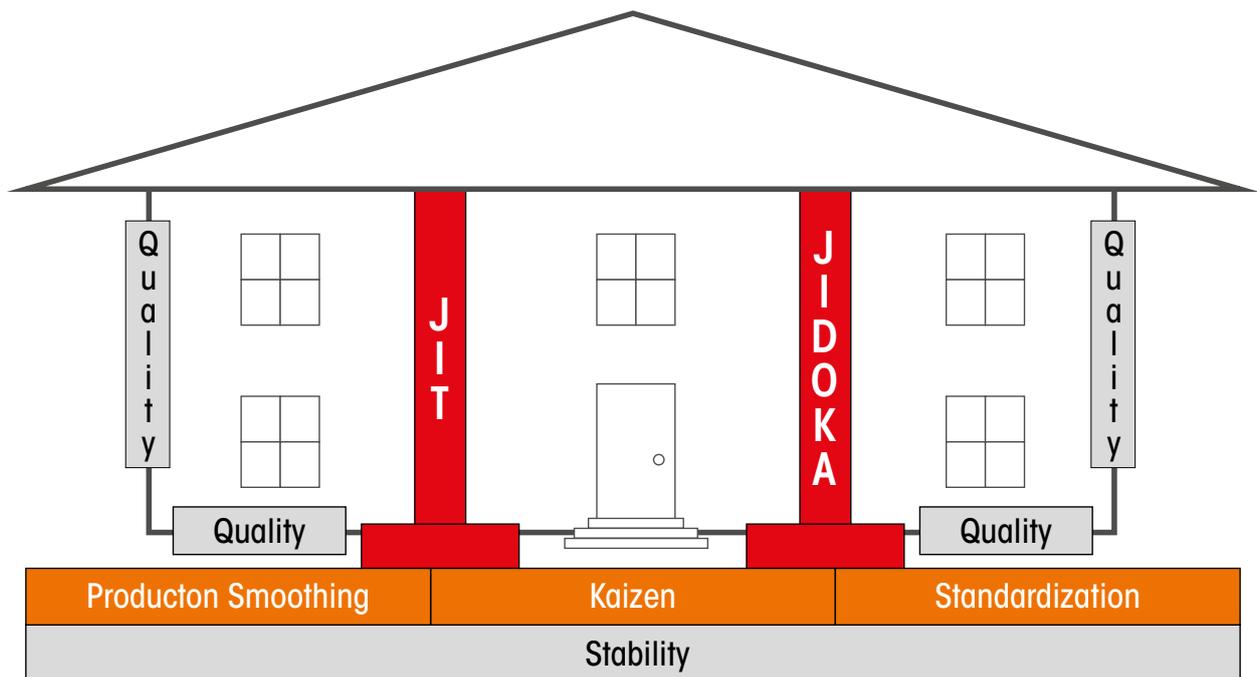


To achieve this aim we offer a comprehensive range of high-end products and components. In the development phase all MEKRA Lang departments work as one to achieve the perfect processing and finishing of our products and thus a long life span even under the most extreme of conditions.

Production Expertise

Lean management in mirror and electronics production

Lean manufacturing



In 2005, our company introduced the principle of lean manufacturing as exemplified by the Toyota Production System (see graphic) and has consistently implemented it ever since. This means that we focus on customer satisfaction and strive for continuous process improvement along the entire value chain.

It is of crucial importance that these goals are actively supported by all employees through complete buy-in and a constant appetite for change. This enables us to harness our competitive advantages and provide our global customers with high quality products. The MEKRA production system is based on consistent waste elimination and reduction of cycle times. By applying the principles of one-piece flow manufacturing and using small production units, we are able to respond to our customers' demands with a high degree of speed and flexibility. The improvement process is supported by standardized procedures which are continuously verified.

In keeping to our motto "If you don't go forward, you go backwards", we are committed to the continuous improvement of our processes which in turn enables us to provide our customers with flexible solutions. In order to implement the holistic aspects of lean production, MEKRA Lang also shares its insights and knowledge in the field of lean manufacturing with its suppliers and customers.

Mirror production



Our assembly lines are structured according to LEAN principles. This is why we are able to respond to customer demands with utmost speed and efficiency.

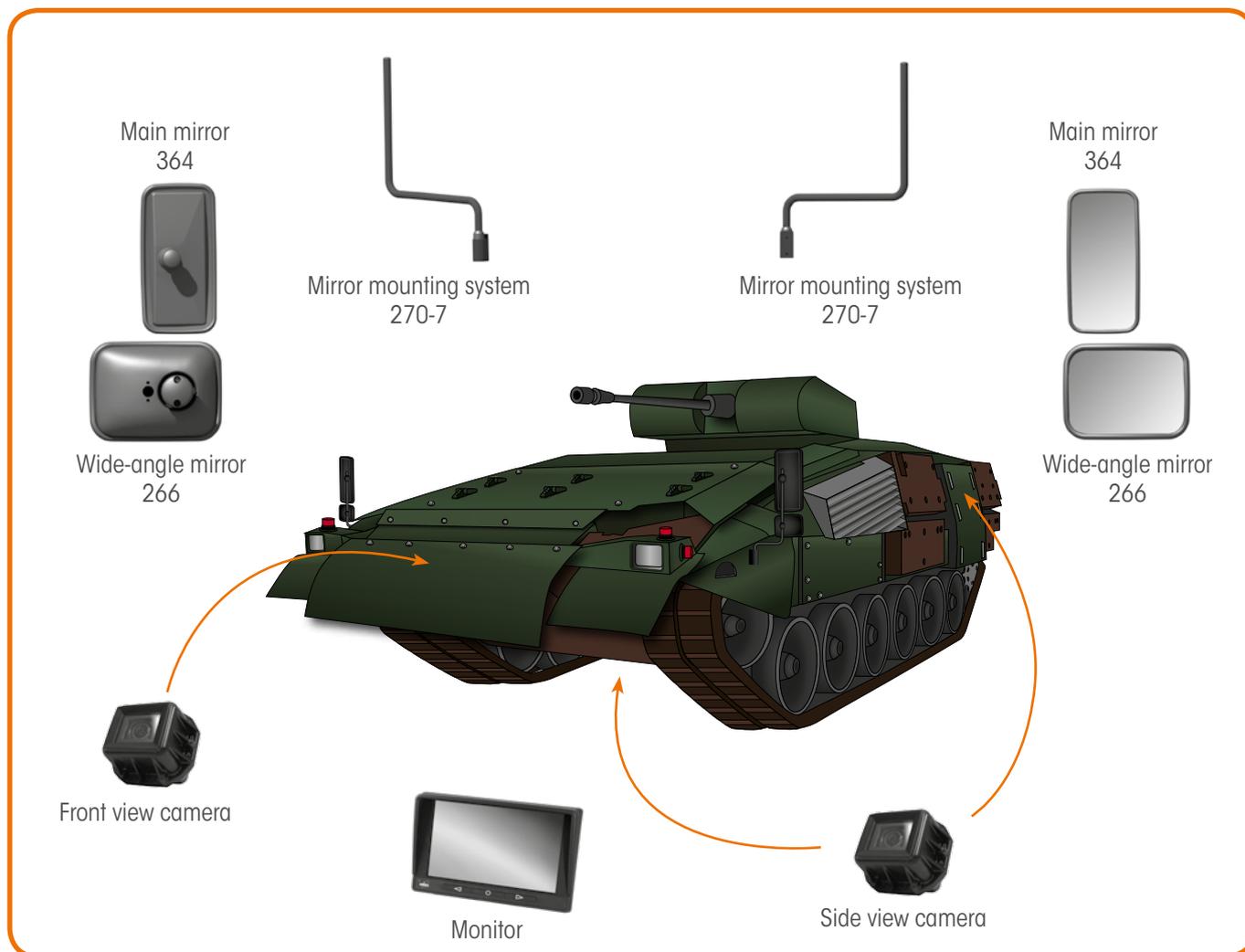
By applying various poka yoke solutions, we ensure that our product quality is consistently high. Through continuous training and support of our employees, we have optimized our personnel deployment.

Electronics production



Armored Personnel Carrier

Combined MEKRA mirror camera system



MEKRA mirror system

Part No.

364	Main mirror left and right side, 1200 mm radius of curvature, heated 24V	51.3640.001.009
266	Wide-angle mirror left and right side, 300 mm radius of curvature, heated 24V	56.2660.001.099
270-7	Mirror mounting system left side, \varnothing 28 mm (customized for your vehicle)	58.2707.XXX.XXX
270-7	Mirror mounting system right side, \varnothing 28 mm (customized for your vehicle)	58.2707.XXX.XXX

MEKRA camera system

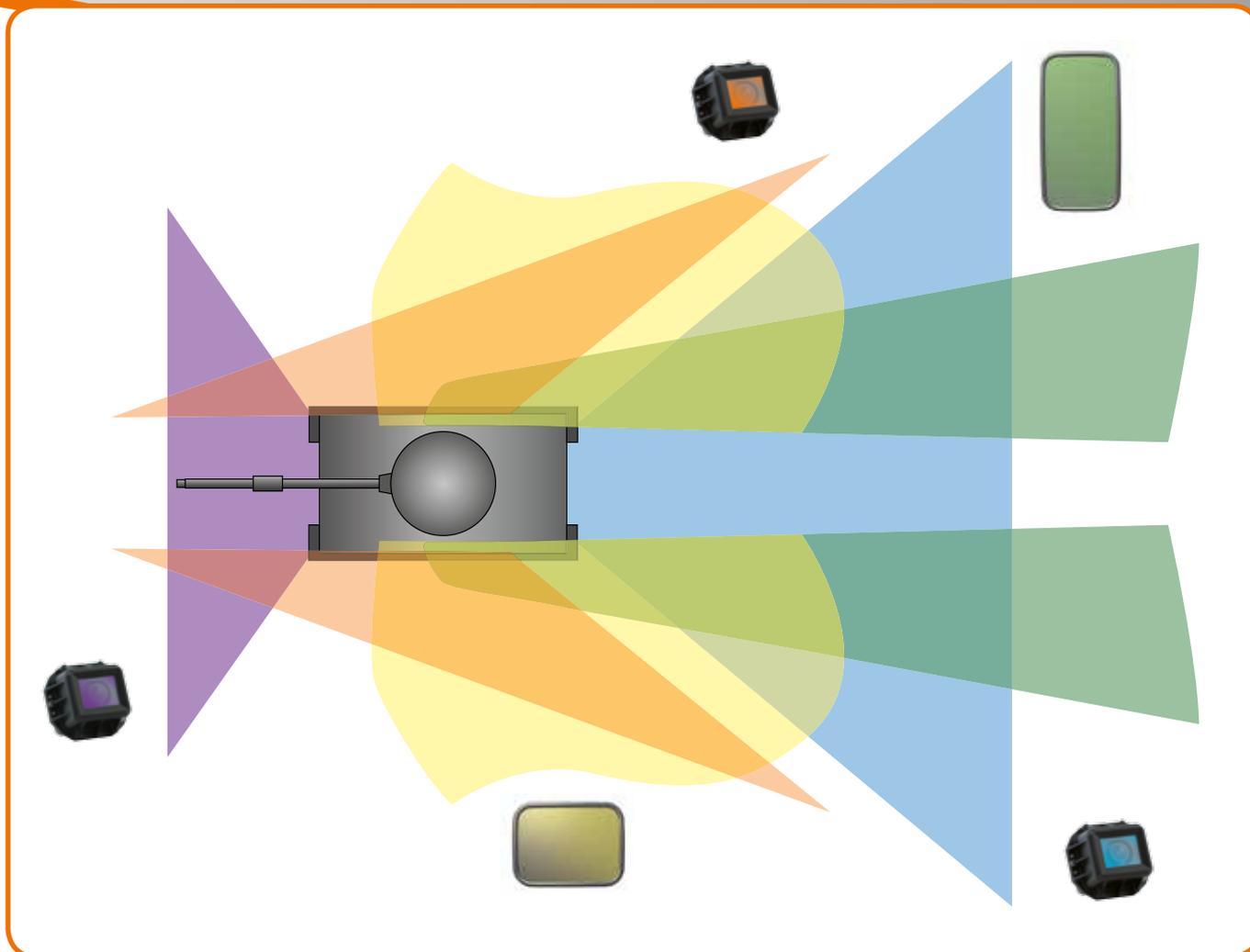
Part No.

MCC	Front view camera, CMOS color camera 120°	28.1301.003.099
MCC	2x side view camera, CMOS color camera 100°	28.1301.001.099
MCM	TFT monitor 7", 4 camera inputs	24.1301.501.099

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

MEKRA Surround View Systems

Combined MEKRA mirror camera system



The development of surround view systems is our core competency. It is our goal to increase work and traffic safety as well as to improve work efficiency and performance. To this end, MEKRA offers a product portfolio that is as diverse and versatile as its many areas of application.

On the following pages, you will find suggestions for ideal-typical configurations to help you put together a product selection that best suits your requirements while ensuring compliance with ECE R46/04. In individual cases, specific components must be selected based on the special characteristics of the special vehicles machinery in question.

Our highly qualified employees will be glad to help you select a surround vision system that is a perfect match for your machine requirements and to find the most efficient solution for you.

Call on us – we love a challenge!

Tank

MEKRA mirror system



Main mirror
364



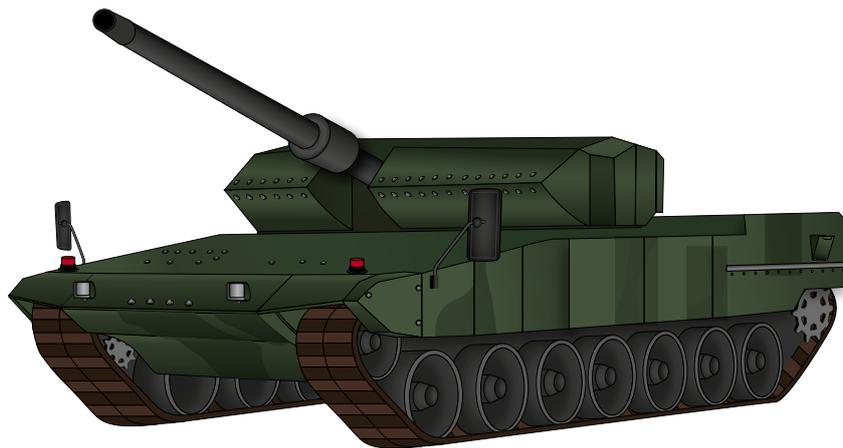
Mirror mounting system
270-7



Mirror mounting system
270-7



Main mirror
364



MEKRA mirror system

Part No.

364	Main mirror left and right side, 1200 mm radius of curvature, heated 24V	51.3640.001.009
270-7	Mirror mounting system left side, \varnothing 28 mm (customized for your vehicle)	58.2707.XXX.XXX
270-7	Mirror mounting system right side, \varnothing 28 mm (customized for your vehicle)	58.2707.XXX.XXX

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

Scout Vehicle

MEKRA mirror system



MEKRA mirror system

Part No.

1010	Main mirror left and right side, 1200 mm radius of curvature	51.1010.001.001
1016	Mirror mounting system left side, \varnothing 22 mm, bolted (customized for your vehicle)	58.1016.XXX.XXX
1016	Mirror mounting system right side, \varnothing 22 mm, bolted (customized for your vehicle)	58.1016.XXX.XXX
266	Wide-angle mirror left and right side, 1200 mm radius of curvature	56.2660.002.099
1016	Mirror mounting system left side, \varnothing 22 mm, mounted by hexagon (customized for your vehicle)	58.1016.XXX.XXX
1016	Mirror mounting system right side, \varnothing 22 mm, mounted by hexagon (customized for your vehicle)	58.1016.XXX.XXX
	Hexagon left and right side	20.1016.000.400

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

Armored Multi Purpose Vehicle

MEKRA mirror system



MEKRA mirror system

Part No.

349	Main mirror and close proximity mirror, left side, electrically controlled, heated 24V	51.3492.115.000
270	Mirror mounting system left side, \varnothing 28/18 mm	58.2704.149
349	Main mirror and close proximity mirror, right side, electrically controlled, heated 24V	51.3492.125.000
270	Mirror mounting system right side, \varnothing 28/18 mm	58.2704.148
558	Roof mirror, left side, 300 mm radius of curvature	59.5580.147H
270	Mirror mounting system left side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
558	Roof mirror, right side, 300 mm radius of curvature	56.5580.001.002
270	Mirror mounting system right side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
271A	Wedge mount left and right side	20.2710.620

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

Armored Modular Vehicle

MEKRA mirror system



MEKRA mirror system

Part No.

572	Main mirror, 1200 mm radius of curvature, electrically controlled, heated 24V	51.5720.260
270	Mirror mounting system left and right side, \varnothing 28 mm	58.2704.079
552	Roof mirror, left and right side, 300 mm radius of curvature	51.5524.950H
270	Mirror mounting system left side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
270	Mirror mounting system right side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
271A	Wedge mount left and right side	20.2710.620

MEKRA camera system

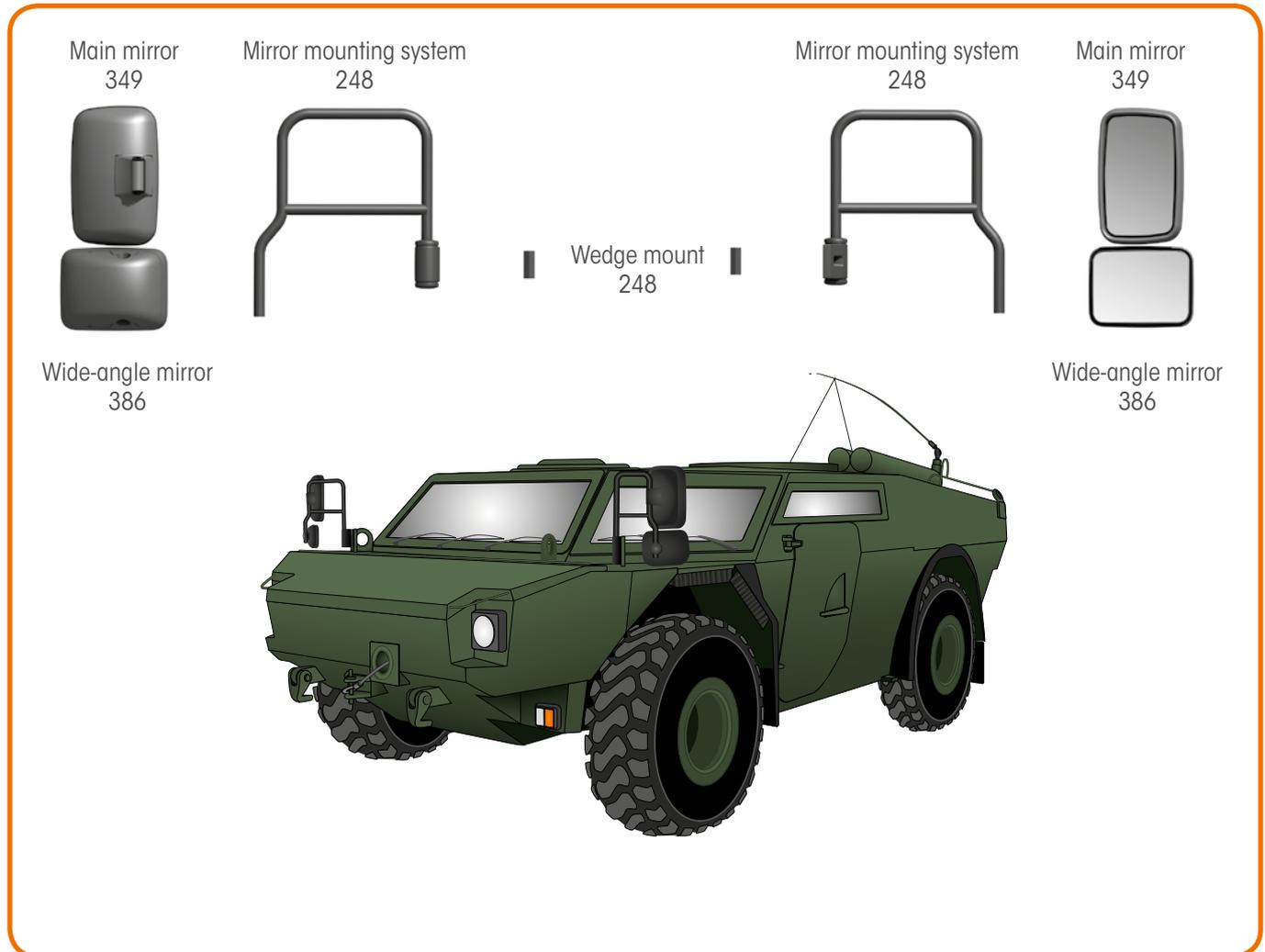
Part No.

MCC	Front view camera, CMOS color camera 120°	28.1301.003.099
MCC	Rear view camera, CMOS color camera 120°	28.1301.003.099
MCM	TFT monitor 7", 4 camera inputs	24.1301.501.099

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

Armored Reconnaissance Vehicle

MEKRA mirror system



MEKRA mirror system

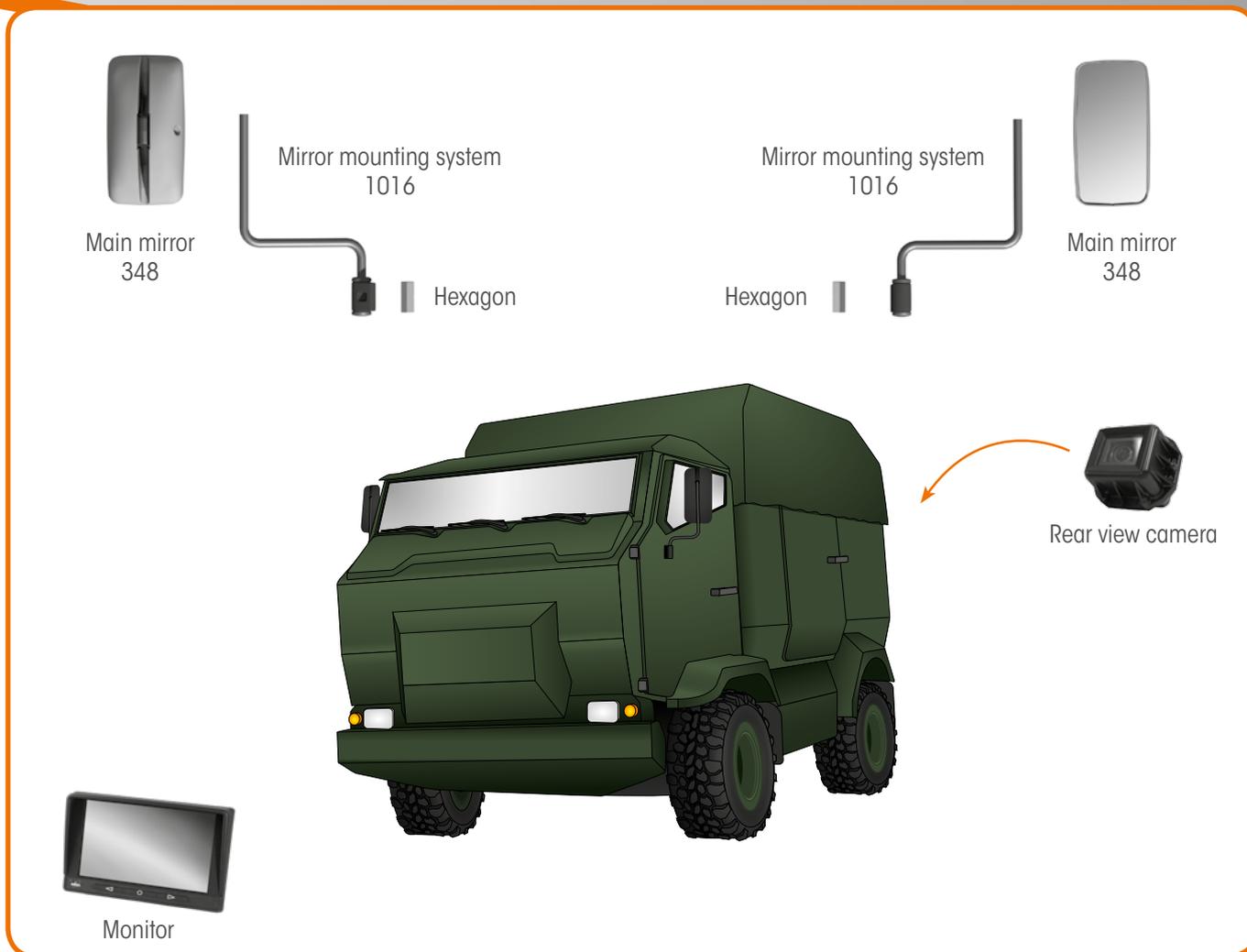
Part No.

349	Main mirror, left side, 1800 mm radius of curvature, electrically controlled, heated 24V	51.3491.115
386	Wide-angle mirror left and right side, 300 mm radius of curvature	61.3865.124H
248	Mirror mounting system left side, \varnothing 18 mm (customized for your vehicle)	58.3490.XXX.XXX
349	Main mirror, right side, 1800 mm radius of curvature, electrically controlled, heated 24V	51.3491.125
248	Mirror mounting system right side, \varnothing 18 mm (customized for your vehicle)	58.3490.XXX.XXX
248	Wedge mount left and right side	20.2480.210

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

Air Transportable Vehicle

Combined MEKRA mirror camera system



MEKRA mirror system

Part No.

348	Main mirror, left and right side, 1200 mm radius of curvature	61.3481.149H
1016	Mirror mounting system left side, \varnothing 22 mm, mounted by hexagon (customized for your vehicle)	58.1016.XXX.XXX
1016	Mirror mounting system right side, \varnothing 22 mm, mounted by hexagon (customized for your vehicle)	58.1016.XXX.XXX
	Hexagon left and right side	20.1016.000.400

MEKRA camera system

Part No.

MCC	Rear view camera, low distorsion, CMOS color camera 120°	28.1301.005.099
MCM	TFT monitor 7", 4 camera inputs	24.1301.501.099

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

Armored Auxiliary Vehicle

MEKRA mirror system



MEKRA mirror system

1009	Main mirror with close-proximity mirror, electrically controlled, heated 24V
270	Mirror mounting system left side, \varnothing 28/18 mm (customized for your vehicle)
270	Mirror mounting system right side, \varnothing 28/18 mm (customized for your vehicle)
271A	Wedge mount left and right side

Part No.

51.1009.025.001
58.2704.XXX.XXX
58.2704.XXX.XXX
20.2710.620

MEKRA camera system

MCC	Rear view camera, low distorsion, CMOS color camera 120°
MCM	TFT monitor 7", 4 camera inputs

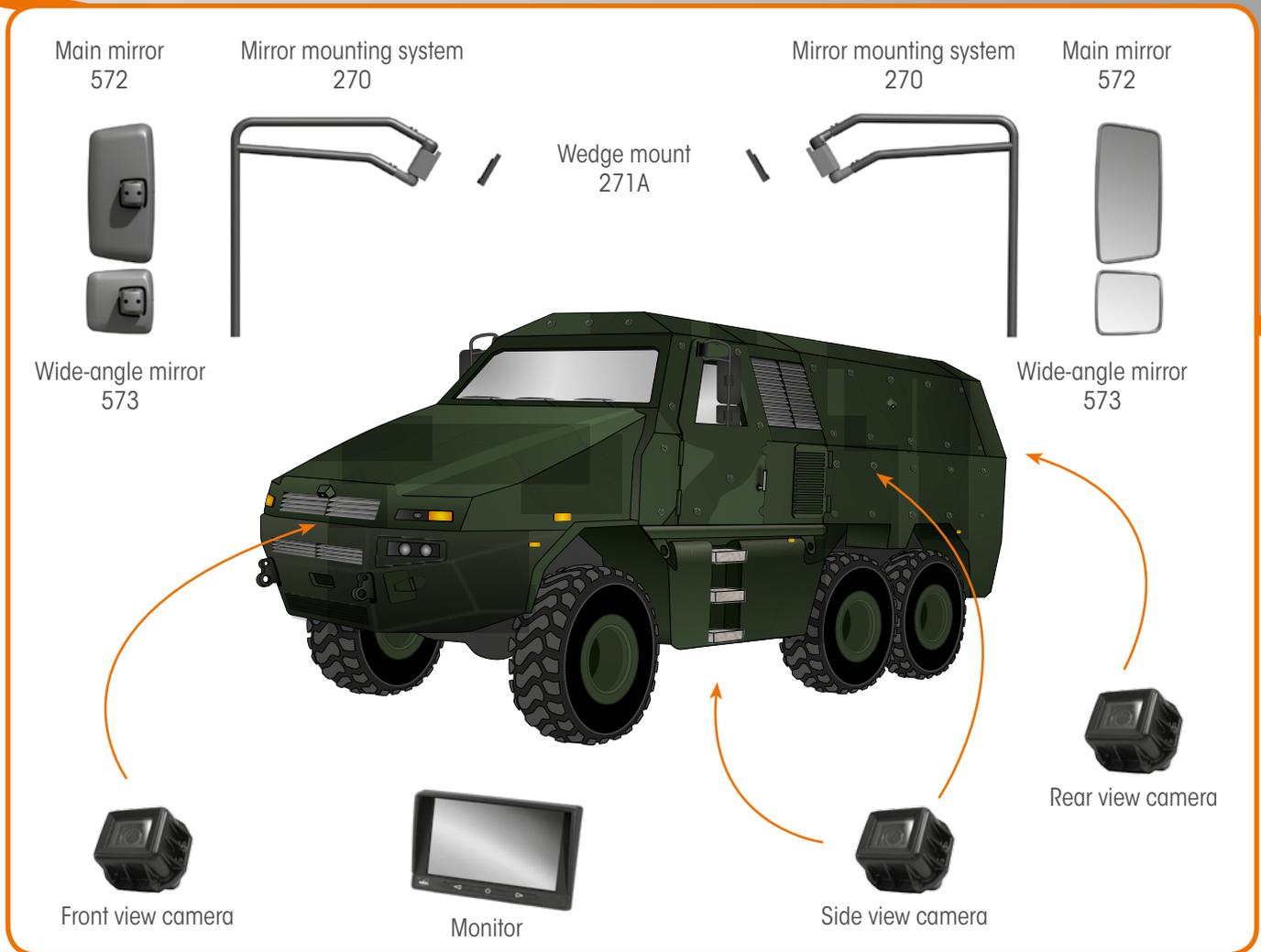
Part No.

28.1301.005.099
24.1301.501.099

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

3x3 Troop Carrier

Combined MEKRA mirror camera system



MEKRA mirror system

Part No.

572	Main mirror, 1200 mm radius of curvature, electrically controlled, heated 24V	51.5720.260
573	Wide-angle mirror, left and right side, 300 mm radius of curvature, heated 24V	56.5730.140H
270	Mirror mounting system left side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
270	Mirror mounting system right side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
271A	Wedge mount left and right side	20.2710.620

MEKRA camera system

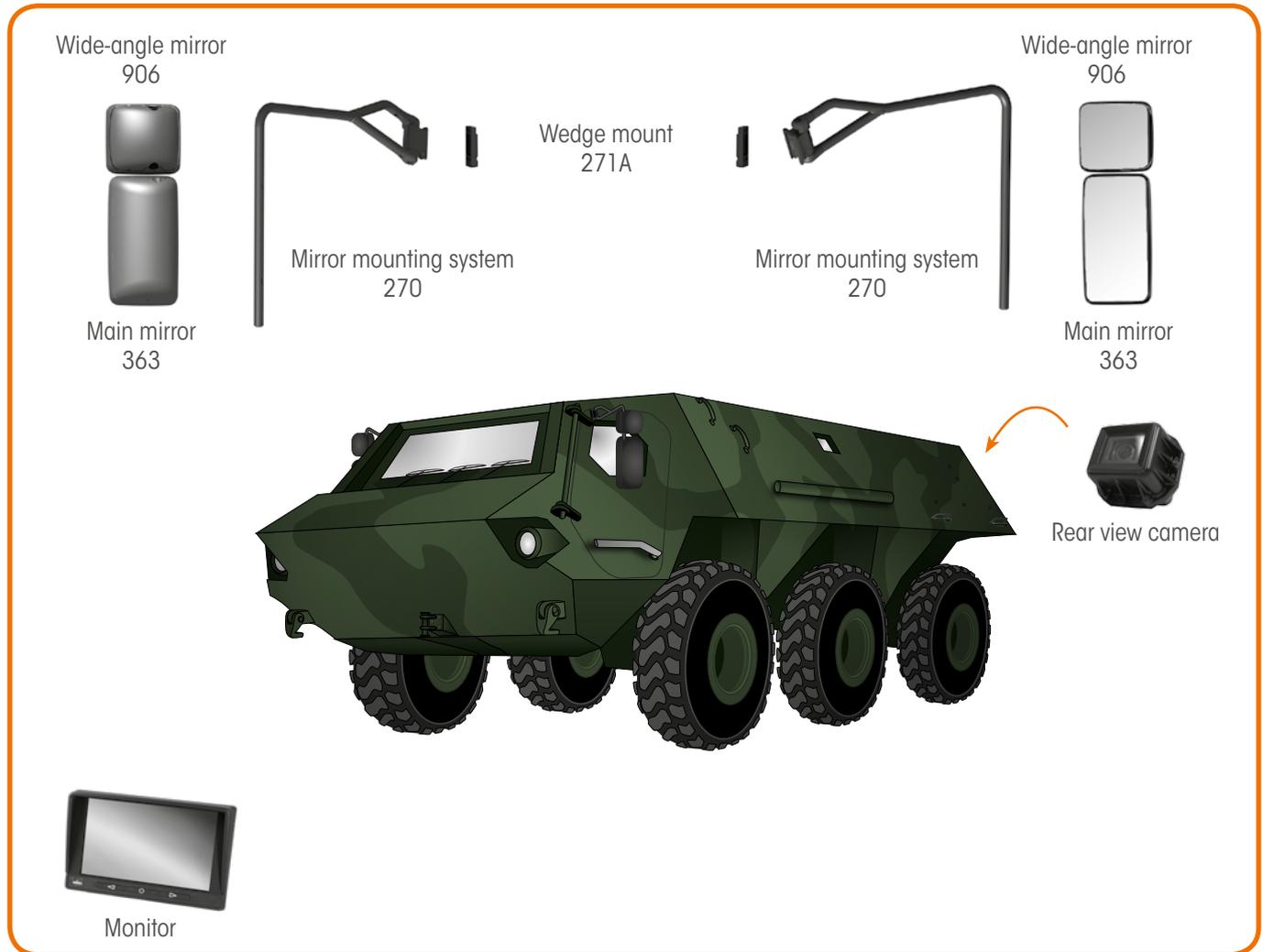
Part No.

MCC	Front view camera, CMOS color camera 120°	28.1301.003.099
MCC	Rear view camera, CMOS color camera 120°	28.1301.003.099
MCC	2x side view camera, CMOS color camera 100°	28.1301.001.099
MCM	TFT monitor 7", 4 camera inputs	24.1301.501.099

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

6x6 Troop Carrier

Combined MEKRA mirror camera system



MEKRA mirror system

Part No.

363	Main mirror, left side, 1200 mm radius of curvature, electrically controlled, heated 24V	51.3635.206
363	Main mirror, right side, 1200 mm radius of curvature, electrically controlled, heated 24V	51.3636.206
906	Wide-angle mirror left and right side, 300 mm radius of curvature, heated 24V	56.9065.110
270	Mirror mounting system left side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
270	Mirror mounting system right side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
271A	Wedge mount left and right side	20.2710.620

MEKRA camera system

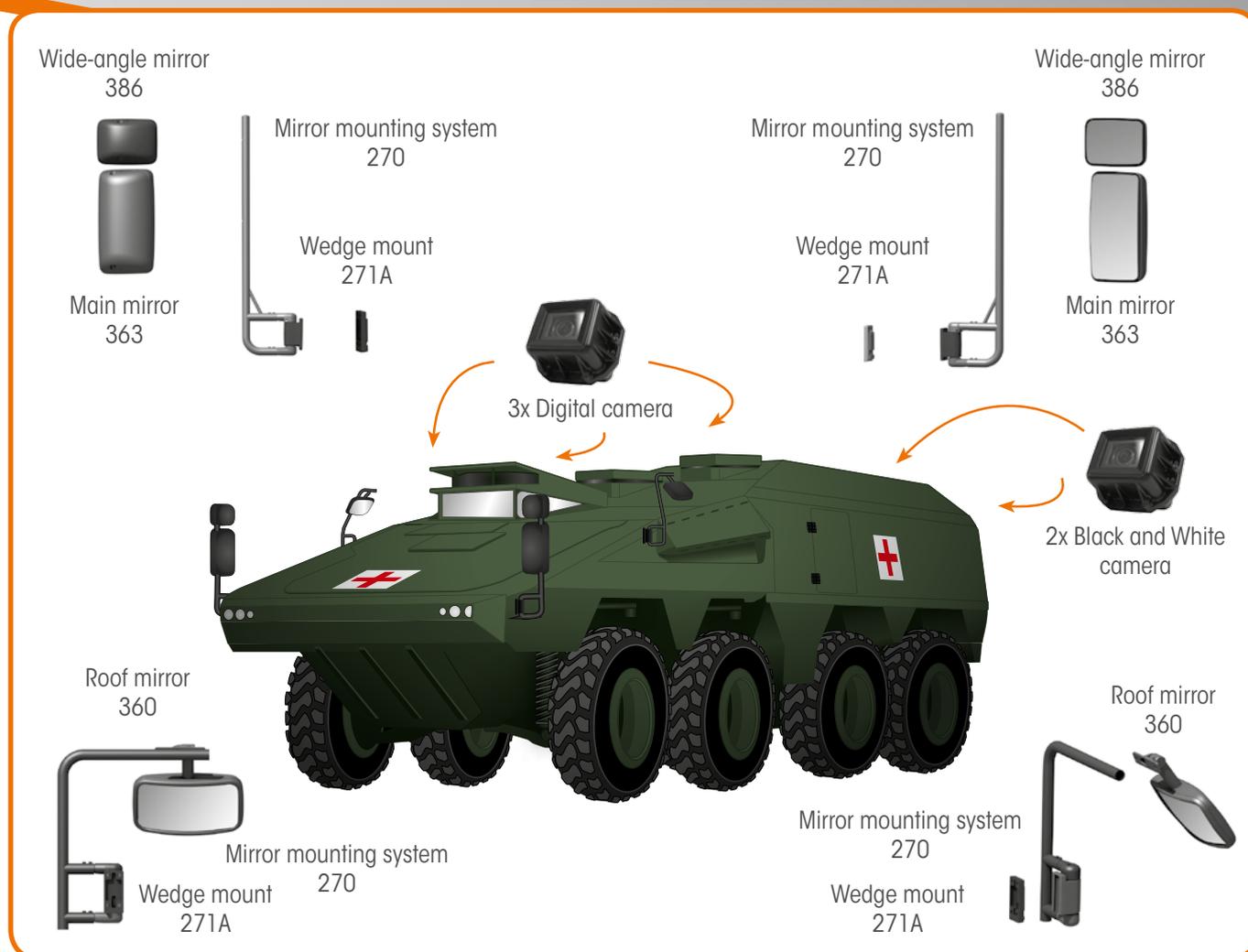
Part No.

MCC	Rear view camera, CMOS color camera 120°	28.1301.003.099
MCM	TFT monitor 7", 4 camera inputs	24.1301.501.099

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

8x8 Troop Carrier

Combined MEKRA mirror camera system



MEKRA mirror system

Part No.

363	Main mirror, left side, 1200 mm radius of curvature, electrically controlled, heated 24V	51.3635.206
363	Main mirror, right side, 1200 mm radius of curvature, electrically controlled, heated 24V	51.3636.206
386	Wide-angle mirror left and right side, 300 mm radius of curvature	61.3865.124H
270	Mirror mounting system left side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
270	Mirror mounting system right side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX
271A	Wedge mount left and right side	20.2710.620
360	Roof mirror left side, 300 mm radius of curvature, heated 24V	59.3602.189
270	Mirror mounting system left and right side, \varnothing 28 mm (customized for your vehicle)	58.2704.XXX.XXX

MEKRA camera system

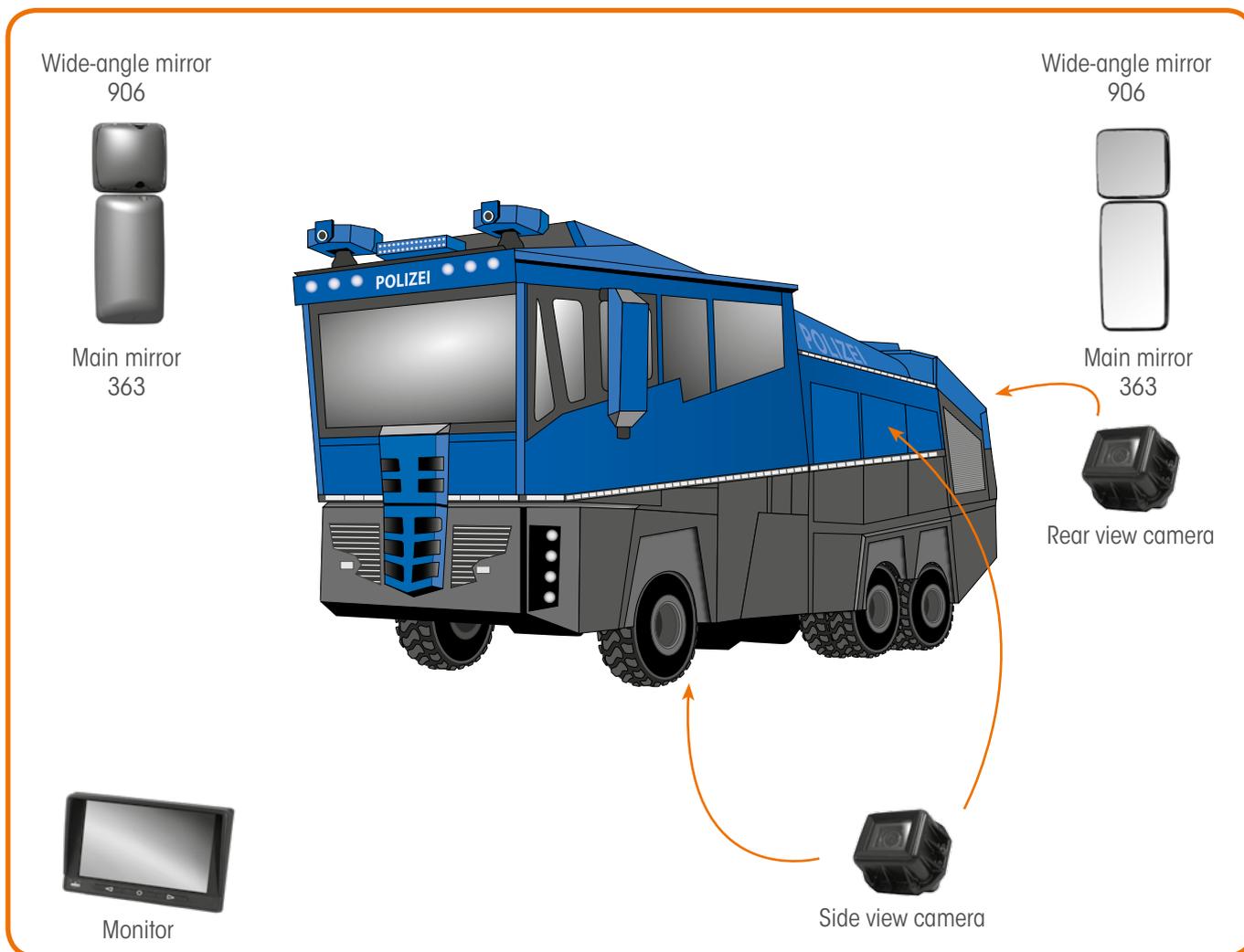
Part No.

MCC	3x Digital camera 100°	28.1200.002.001
MCC	2x Black and White camera 100°	28.1200.001.001

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

Police Vehicle

Combined MEKRA mirror camera system



MEKRA mirror system

Part No.

363	Main mirror, left side, 1200 mm radius of curvature, electrically controlled, heated 24V	51.3635.206
363	Main mirror, right side, 1200 mm radius of curvature, electrically controlled, heated 24V	51.3636.206
906	Wide-angle mirror left and right side, 300 mm radius of curvature, heated 24V	56.9065.110

MEKRA camera system

Part No.

MCC	Rear view camera, CMOS color camera 120°	28.1301.003.099
MCC	2x side view camera, CMOS color camera 100°	28.1301.001.099
MCM	TFT monitor 7", 4 camera inputs	24.1301.501.099

The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

Airport Crash Tender

MEKRA mirror system



MEKRA mirror system

Part No.

271	Main mirror, left side, 1800 mm radius of curvature	59.2712.111
271	Main mirror, right side, 1800 mm radius of curvature	59.2712.114
	Rubber bellow, left side and right side	20.2710.200H
	Adapter, left and right side	20.2700.200H

MEKRA camera system

Part No.

MCC	Rear view camera, CMOS color camera 120°	28.1301.003.099
MCC	2x side view camera, CMOS color camera 100°	28.1301.001.099
MCM	TFT monitor 7", 4 camera inputs	24.1301.501.099

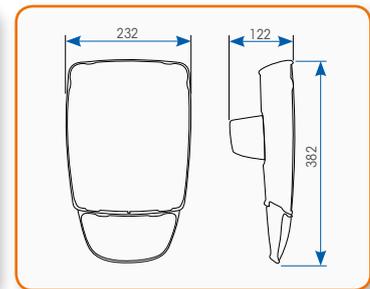
The systems shown are recommended by MEKRA Lang. Beginning on page 26, you will find additional MEKRA product solutions and alternatives.

Mirror Systems

Main mirror

Modular mirror system 1009, homologated for field-of-vision class II

Glass size (WxH)	Main mirror 225 x 286 mm, close-proximity mirror 178 x 91 mm
Radius of curvature	Main mirror 1200 mm, close-proximity mirror 240 mm
Mounting side	right and left side
Heating system	unheated or heated 12 or 24V
Adjustment	manual or electrical, 12 or 24V
Adjustment range	up/down: $>\pm 8^\circ$ - left/right: $>\pm 8^\circ$
Mirror mounting bracket interface	Clamp for 18-22 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant



Options (more on request)

Main mirror 1

51.1009.001.001	right and left-hand mount	manual adjustment	unheated	
51.1009.081.001	right and left-hand mount	manual adjustment	heated 12V	2-lead flange socket
51.1009.113.001	right and left-hand mount	electrical adjustment	heated 12V	6-lead flange socket
51.1009.009.001	right and left-hand mount	electrical adjustment	heated 24V	6-lead flange socket

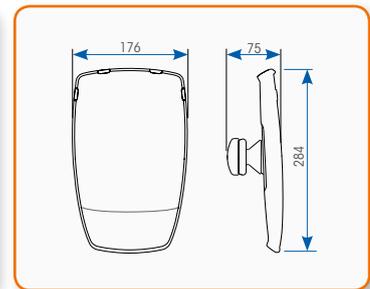
Main and close-proximity mirror combination 2

51.1009.017.001	right and left-hand mount	manual adjustment	unheated	
51.1009.049.001	right and left-hand mount	manual adjustment	heated 12V	2-lead flange socket
51.1009.097.001	right and left-hand mount	electrical adjustment	heated 12V	6-lead flange socket
51.1009.025.001	right and left-hand mount	electrical adjustment	heated 24V	6-lead flange socket



Compact mirror 1010, homologated for field-of-vision class II

Glass size (WxH)	169 x 277 mm
Radius of curvature	1200 mm
Mounting side	right and left side
Heating system	unheated
Adjustment	manual
Adjustment range	up/down: $>\pm 9^\circ$ - left/right: $>\pm 9^\circ$
Mirror mounting bracket interface	Clamp for 14-20 or 18-22 mm tube diameter
On-board power supply connection	-
Material	shock-proof ABS plastic, black, UV resistant



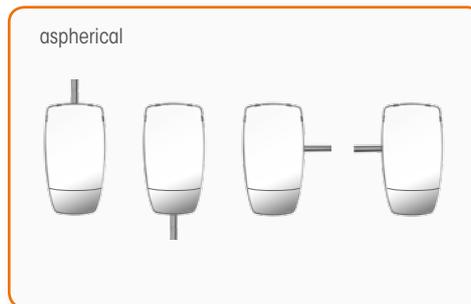
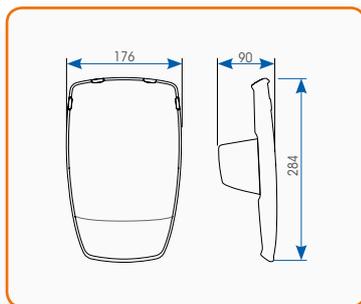
Options (more on request)

for tube diameter 14-20 mm 1

51.1010.000.001	right and left-hand mount	manual adjustment	unheated	with aspherical glass portion
51.1010.010.001	right and left-hand mount	manual adjustment	unheated	with spherical glass portion

for tube diameter 18-22 mm 2

51.1010.001.001	right and left-hand mount	manual adjustment	unheated	with aspherical glass portion
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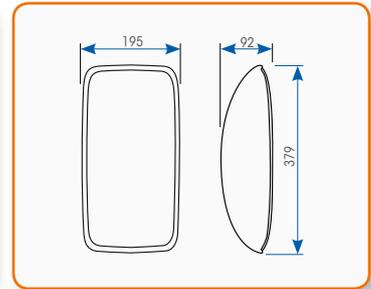


Mirror Systems

Main- & wide-angle mirror

Main mirror 348, homologated for field-of-vision class II

Glass size (WxH)	190 x 375 mm
Radius of curvature	1200 mm
Mounting side	right and left side
Heating system	heated 24V, unheated upon request
Adjustment	manual or electrical, 24V
Adjustment range	up/down: $>\pm 10^\circ$ - left/right: $>\pm 10^\circ$
Mirror mounting bracket interface	Clamp for 22 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting upon request
Material	shock-proof ABS plastic, black, UV resistant

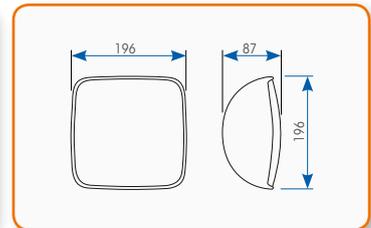


Options

61.3480.149 H	right and left-hand mount	manual adjustment	heated 24V	 2-lead flange socket
61.3481.149 H	right and left-hand mount	electrical adjustment	heated 24V	 6-lead flange socket

Wide-angle mirror 348, homologated for field-of-vision class IV

Glass size (WxH)	191,5 x 191,5 mm
Radius of curvature	300 mm
Mounting side	right and left side
Heating system	heated 24V, unheated upon request
Adjustment	manual
Adjustment range	up/down: $>\pm 10^\circ$ - left/right: $>\pm 10^\circ$
Mirror mounting bracket interface	Clamp for 22 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant

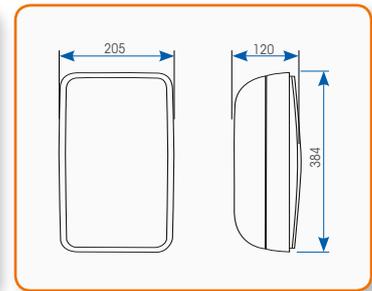


Option

61.3482.149H	right and left-hand mount	manual adjustment	heated 24V	 2-lead flange socket
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Main mirror 363, homologated for field-of-vision class II

Glass size (WxH)	185 x 363,5 mm
Radius of curvature	1200 mm
Mounting side	right or left side
Heating system	unheated or heated 12 or 24V
Adjustment	manual or electrical, 12 or 24V
Adjustment range	up/down: $>\pm 7^\circ$ - left/right: $>\pm 13^\circ$
Mirror mounting bracket interface	Clamp for 18–28 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting upon request
Material	shock-proof ABS plastic, black, UV resistant

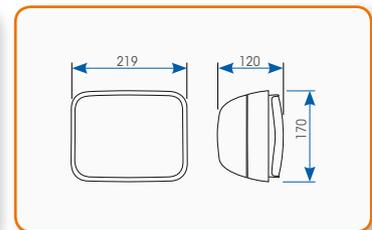


Options (more on request)

51.3635.201	left-hand mount	manual adjustment	unheated	
51.3636.201	right-hand mount	manual adjustment	unheated	
51.3635.204	left-hand mount	manual adjustment	heated 24V	2-lead flange socket
51.3636.204	right-hand mount	manual adjustment	heated 24V	2-lead flange socket
51.3635.206	left-hand mount	electrical adjustment	heated 24V	6-lead flange socket
51.3636.206	right-hand mount	electrical adjustment	heated 24V	6-lead flange socket

Wide-angle mirror 386, homologated for field-of-vision class IV

Glass size (WxH)	149 x 198 mm
Radius of curvature	400 mm
Mounting side	right and left side/right or left side
Heating system	unheated or heated 12 or 24V
Adjustment	manual or electrical, 12 or 24V
Adjustment range	up/down: $>\pm 6^\circ$ - left/right: $>\pm 8^\circ$
Mirror mounting bracket interface	Clamp for 18–28 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting upon request
Material	shock-proof ABS plastic, black, UV resistant



Options (more on request)

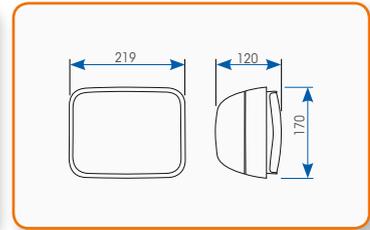
56.3860.212	right and left-hand mount	manual adjustment	unheated	
56.3860.214	right and left-hand mount	manual adjustment	heated 24V	2-lead flange socket
56.3861.116H	left-hand mount	electrical adjustment	heated 24V	6-lead flange socket
56.3862.116H	right-hand mount	electrical adjustment	heated 24V	6-lead flange socket

Mirror Systems

Main- & wide-angle mirror

Wide-angle mirror 386-1, homologated for field-of-vision class IV

Glass size (WxH)	149 x 198 mm
Radius of curvature	300 mm
Mounting side	right and left side
Heating system	unheated or heated 24V
Adjustment	manual
Adjustment range	up/down: $>\pm 6^\circ$ - left/right: $>\pm 8^\circ$
Mirror mounting bracket interface	Clamp for 18–28 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant

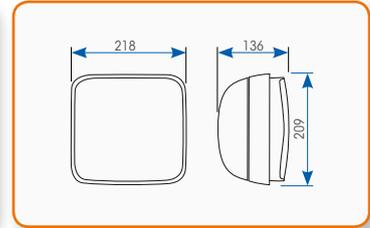


Option (more on request)

61.3865.124H	right and left-hand mount	manual adjustment	heated 24V	2-lead flange socket
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Wide-angle mirror 906, homologated for field-of-vision class IV

Glass size (WxH)	198 x 189 mm
Radius of curvature	300 mm
Mounting side	right and left side
Heating system	unheated or heated 24V
Adjustment	manual
Adjustment range	up/down: $>\pm 10^\circ$ - left/right: $>\pm 10^\circ$
Mirror mounting bracket interface	Clamp for 20–28 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant

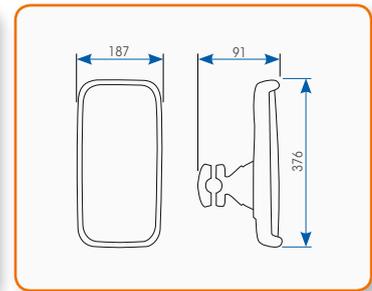


Options (more on request)

56.9065.132	right and left-hand mount	manual adjustment	unheated	
56.9065.110	right and left-hand mount	manual adjustment	heated 24V	2-lead flange socket

Main mirror 364, homologated for field-of-vision class II

Glass size (WxH)	175 x 355 mm
Radius of curvature	1200 and 1800 mm
Mounting side	right and left side
Heating system	unheated or heated 12 or 24V
Adjustment	manual
Adjustment range	up/down: $>\pm 15^\circ$ - left/right: $>\pm 15^\circ$
Mirror mounting bracket interface	Clamp for 14–20 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant



Options (more on request)

1200 mm radius of curvature

51.3640.128.001	right and left-hand mount	manual adjustment	unheated
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1800 mm radius of curvature

51.3640.127	right and left-hand mount	manual adjustment	unheated
51.3640.137H	right and left-hand mount	manual adjustment	heated 12V
51.3640.147H	right and left-hand mount	manual adjustment	heated 24V



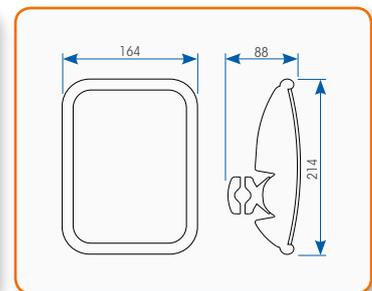
2-lead flange socket



2-lead flange socket

Wide-angle mirror 266, homologated for field-of-vision class IV

Glass size (WxH)	214 x 164 mm
Radius of curvature	400 mm
Mounting side	right and left side
Heating system	unheated or heated 24V
Adjustment	manual
Adjustment range	up/down: $>\pm 15^\circ$ - left/right: $>\pm 15^\circ$
Mirror mounting bracket interface	Clamp for 14–20 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant



Options (more on request)

56.2660.127H	right and left-hand mount	manual adjustment	unheated
56.2660.147H	right and left-hand mount	manual adjustment	heated 24V



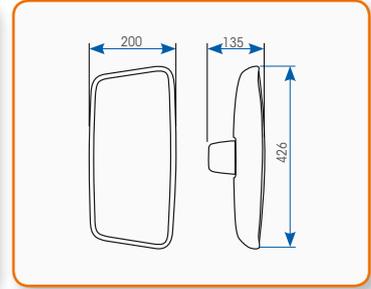
2-lead flange socket

Mirror Systems

Main-, wide-angle & close-proximity mirror

Main mirror 572, homologated for field-of-vision class II

Glass size (WxH)	179 x 405 mm
Radius of curvature	1200 mm
Mounting side	right and left side/right or left
Heating system	unheated or heated 12 or 24V
Adjustment	manual or electrical, 12 or 24V
Adjustment range	up/down: $>\pm 10^\circ$ - left/right: $>\pm 10^\circ$
Mirror mounting bracket interface	Clamp for 22 or 28 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant



Options (more on request)

22 mm tube diameter

51.5720.120H	right and left-hand mount	manual adjustment	unheated
51.5720.140H	right and left-hand mount	manual adjustment	heated 24V
51.5721.160H	left-hand mount	electrical adjustment	heated 24V
51.5722.160H	right-hand mount	electrical adjustment	heated 24V

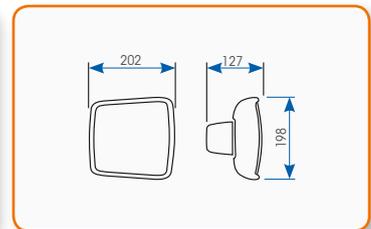
-  2-lead flange socket
-  6-lead flange socket
-  6-lead flange socket

28 mm tube diameter

51.5720.127H	right and left-hand mount	manual adjustment	unheated
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Wide-angle mirror 573, homologated for field-of-vision class IV

Glass size (WxH)	177 x 182 mm
Radius of curvature	300 mm
Mounting side	right and left side
Heating system	unheated or heated 24V
Adjustment	manual
Adjustment range	up/down: $>\pm 10^\circ$ - left/right: $>\pm 10^\circ$
Mirror mounting bracket interface	Clamp for 22 or 28 mm tube diameter
On-board power supply connection	2- or 6-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant



Options (more on request)

22 mm tube diameter

56.5730.120H	right and left-hand mount	manual adjustment	unheated
56.5730.140H	right and left-hand mount	manual adjustment	heated 24V

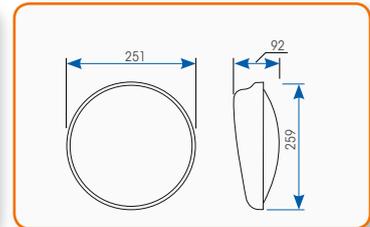
-  2-lead flange socket

28 mm tube diameter

56.5730.127H	right and left-hand mount	manual adjustment	unheated
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Close-proximity mirror 389, homologated for field-of-vision class V

Glass size (Ø)	250 mm
Radius of curvature	240 mm
Mounting position	universal
Heating system	unheated or heated 24V
Adjustment	manual
Adjustment range	up/down: >±10°
Interface	Ball stud and tube connection, customized for vehicle or mounting system, additional options upon request 3
On-board power supply connection	2-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant

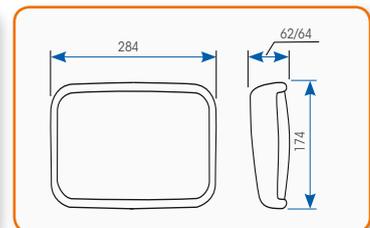


Options (more on request)

51.3894.140 1	universal mount	manual adjustment	unheated	
51.3894.160 1	universal mount	manual adjustment	heated 24V	2-lead flange socket
59.3891.140H 2	universal mount	manual adjustment	unheated	
59.3891.150H 2	universal mount	manual adjustment	heated 24V	2-lead flange socket

Close-proximity mirror 360, homologated for field-of-vision class V

Glass size (WxH)	272 x 162 mm
Radius of curvature	300 or 400 mm
Mounting position	universal
Heating system	unheated or heated 24V
Adjustment	manual
Adjustment range	up/down: >±15°
Vehicle interface	screwed, 2 x M8 through bracket
On-board power supply connection	2-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant



Options (more on request)

short socket, hole spacing 50 mm **1**

300 mm radius of curvature

59.3604.178	universal mount	manual adjustment	heated 24V	2-lead flange socket
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400 mm radius of curvature

59.3604.128	universal mount	manual adjustment	unheated	
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long socket, hole spacing 100 mm **2**

300 mm radius of curvature

59.3601.178	universal mount	manual adjustment	unheated	
59.3601.188	universal mount	manual adjustment	heated 24V	2-lead flange socket

400 mm radius of curvature

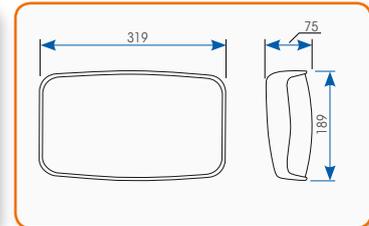
59.3601.128	universal mount	manual adjustment	unheated	
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Mirror Systems

Close-proximity mirror

Close-proximity mirror 552, homologated for field-of-vision class V

Glass size (WxH)	310 x 180 mm
Radius of curvature	300 or 400 mm
Mounting position	universal
Heating system	unheated or heated 24V
Adjustment	manual
Adjustment range	up/down: $\geq \pm 10^\circ$
Interface	Ball stud and tube connection, customized for vehicle or mounting system, additional options upon request
On-board power supply connection	2-lead flange socket, direct contacting and additional options upon request
Material	shock-proof ABS plastic, black, UV resistant



Options (more on request)

300 mm radius of curvature, for ball stud 1

51.5524.930	universal mount	manual adjustment	unheated
51.5524.950H	universal mount	manual adjustment	heated 24V

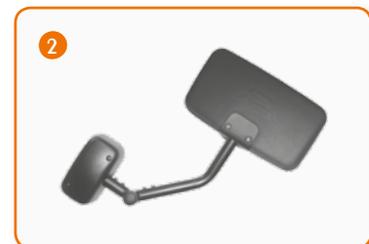


300 mm radius of curvature, screwed with mounting base 2

59.5524.530H	universal mount	manual adjustment	unheated
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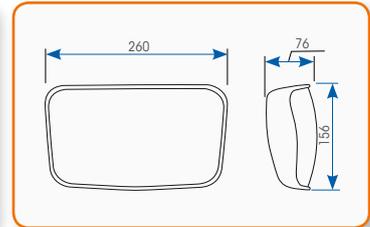
400 mm radius of curvature, for ball stud 3

51.5524.940	universal mount	manual adjustment	unheated
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Close-proximity mirror 558, homologated for field-of-vision class V

Glass size (WxH)	257 x 154 mm
Radius of curvature	300 mm
Mounting position	universal
Heating system	unheated
Adjustment	manual
Adjustment range	up/down: $\geq \pm 10^\circ$
Interface	Ball stud and tube connection, customized for vehicle or mounting system, additional options upon request 1
On-board power supply connection	-
Material	shock-proof ABS plastic, black, UV resistant

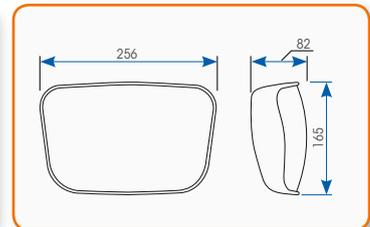


Option

51.5589.100	universal mount	manual adjustment	unheated
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Close-proximity mirror 559, homologated for field-of-vision class V

Glass size (WxH)	248 x 157 mm
Radius of curvature	240 mm
Mounting position	universal
Heating system	unheated
Adjustment	manual
Adjustment range	up/down: $\geq \pm 10^\circ$
Interface	Ball stud and tube connection, customized for vehicle or mounting system, additional options upon request 1
On-board power supply connection	-
Material	shock-proof ABS plastic, black, UV resistant



Option

51.5590.020	universal mount	manual adjustment	unheated
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Mounting Systems

Universal solutions

Mirror mounting system 270A / 271

Maximum throat	700 mm
Tube diameter	28 mm
Mounting side	right or left side, mounting system removable
Adjustment	manual, 30°, 45°, 52°, 60°, 72° bosh angles
Folding torque	30-120 Nm
Vehicle interface	Wedge mount 248-2 A/ 271 A
Wiring	choice of open and hidden cable guiding, 2/6-lead flange socket, open ends or direct contacting
Material	powder-coated tubular steel, black



Options (more on request)

Dimensions: 256 x 450 mm (WxH), 90° bracket angle, including control cable and wedge mount **1**

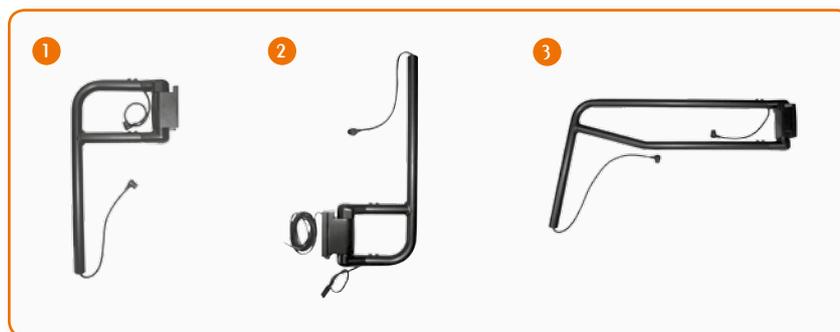
58.2704.051H universal mount  Connector contacting for electrical mirror adjustment for mirror heating

Dimensions: 160 x 500 mm (WxH), 90° bracket angle, including heating cable and wedge mount **2**

58.2704.048 universal mount  Connector contacting for manual mirror adjustment for mirror heating

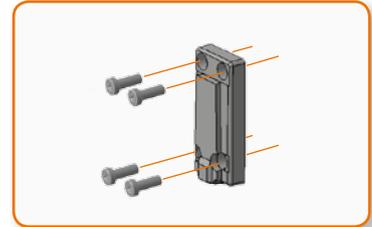
Dimensions: 676 x 327 mm (WxH), 6° bracket angle, including control cable and wedge mount **3**

58.2704.093 universal mount  Direct contacting for electrical mirror adjustment for mirror heating



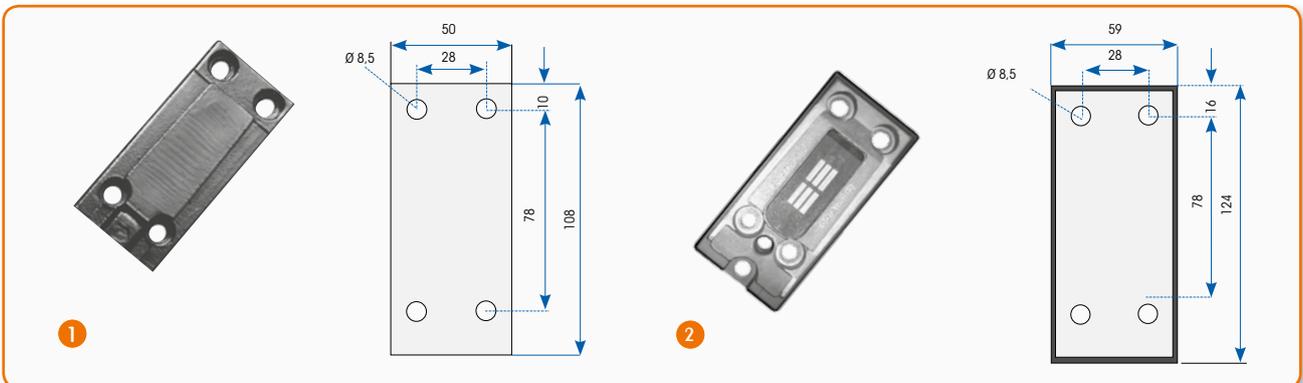
Wedge mounts for mirror mounting system 270A / 271

Size	varying
Design	for plug or direct contacting
Installation	4 mounting points for M8 allen screws
Material	pressure-molded aluminium, powder-coated, black



Options (more on request)

Wedge mount 248-2A for connector contacting, 50 x 108 x 15 mm (WxHxD)		1		
20.2480.210	universal mount	without cable	for manual mirror adjustment	
20.2480.221	universal mount	Plug/cable 2.5 m	for electrical mirror adjustment	for mirror heating
Wedge mount 271 A for direct contacting, 59 x 124 x 21 mm (WxHxD)		2		
20.2710.640	universal mount	Stranded wire/cable 0.15 m	for electrical mirror adjustment	for mirror heating

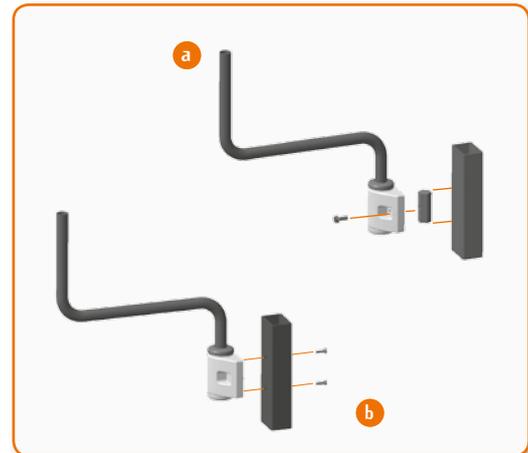


Mounting Systems

Universal solutions

Mirror mounting system 1016

Maximum throat	500 mm
Tube diameter	22 mm
Mounting side	right or left side, mounting system bolted down
Adjustment	manual, bosh angle every 30°
Folding torque	25 Nm
Vehicle interface	mounting element option a: 1x M8 hex attachment (welded to vehicle) option b: 2x M6 for bolting from vehicle side
Wiring	choice of open and hidden cable guiding, 2/6-lead female socket, open ends
Material	Pressure-molded aluminium, powder-coated tubular steel, black



Options (more on request)

U-shaped tubes 1

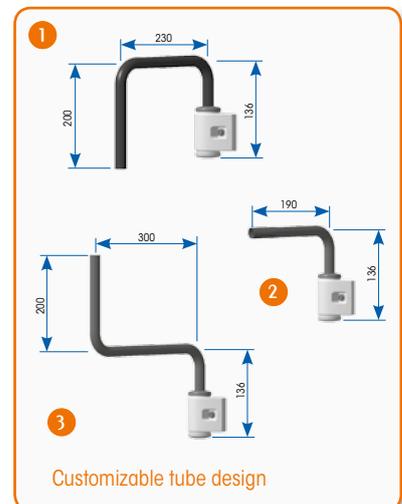
58.1016.001.001	left-hand mount	Option	a
58.1016.002.001	right-hand mount	Option	a
58.1016.003.001	left-hand mount	Option	b
58.1016.004.001	right-hand mount	Option	b

L-shaped tubes 2

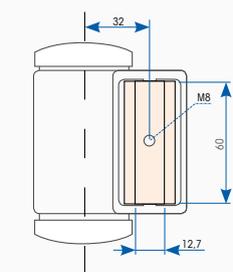
58.1016.009.001	left-hand mount	Option	a
58.1016.010.001	right-hand mount	Option	a

Z-shaped tubes 3

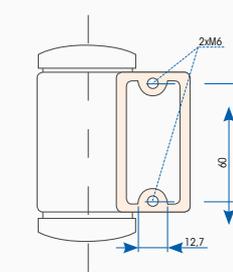
58.1016.005.001	left-hand mount	Option	a
58.1016.006.001	right-hand mount	Option	a



Mounting base bolted through hex attachment



Mounting base directly bolted

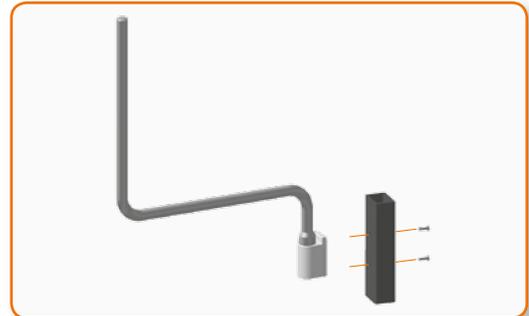


Mounting sides can be switched, tube orientation will change as shown below:



Mirror mounting system 270-7

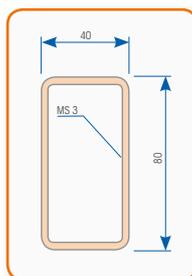
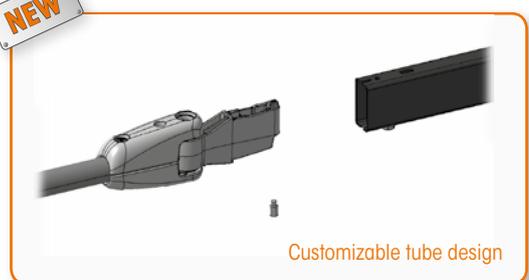
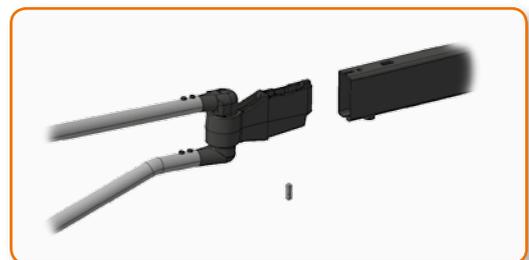
Maximum throat	600 mm
Tube diameter	28 mm
Mounting side	right and left side, mounting system bolted down
Adjustment	manual, bosh angle 51.4°
Folding torque	75 Nm
Vehicle interface	2x M8 for bolting from inside of cabin
Wiring	choice of open and hidden cable guiding, for heated and/or electrically adjustable mirrors
Material	powder-coated tubular steel, black



Tube geometries will be customized to fit your specific vehicle

Mirror mounting system 1011

Maximum throat	up to 700 mm
Tube diameter	28 mm / 40 mm in combination with mirror head 1018
Mounting position	right and left side, mounting system bolted down
Adjustment	manual, bosh angle 52°
Folding torque	60 Nm
Vehicle interface	Insertion into rectangular tube
Wiring	choice of open and hidden cable guiding, 2/6-lead female socket, open ends
Material	Pressure-molded aluminium, powder-coated tubular steel, black



Tube geometries will be customized to fit your specific vehicle

Mounting Systems

Accessories

Individual components (additional options upon request)

Heating cable with connector

- 09.2070.101  2-lead oval right-angle connector - open end, length 2.07 m
09.2000.301  2-lead round right-angle connector - open end, length 2.0 m

Control cable with integrated heating lead

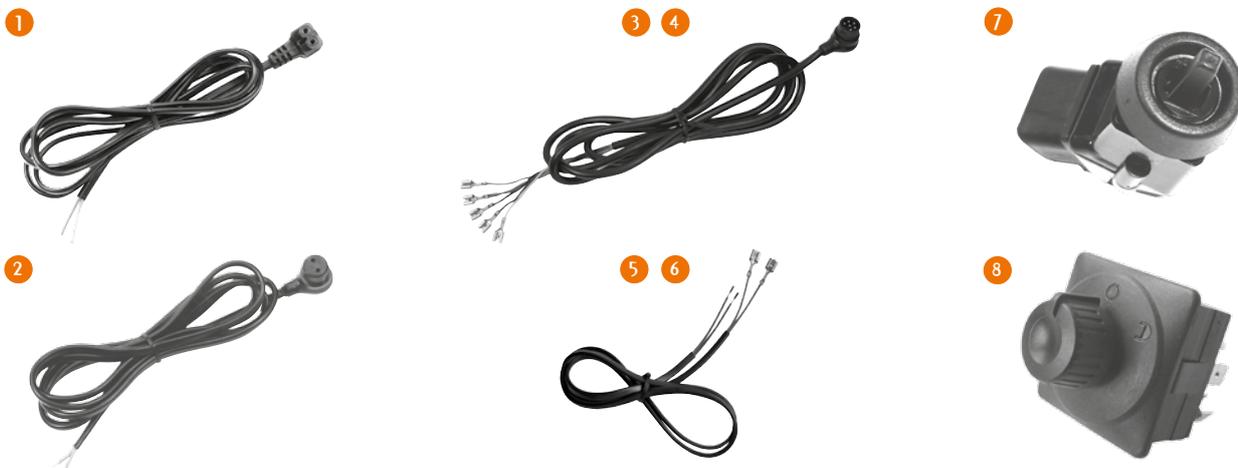
- 09.3200.310  6-lead round right-angle connector - 2.8 crimp, length 2.0 m One-mirror control
09.3200.320  6-lead round right-angle connector - 6.3 crimp, length 2.0 m Two-mirror control

Power-supply line for mirror switch

- 09.3200.210  Open end - 2.8 crimp, length 1.0 m One-mirror control
09.3200.220  Open end - 6.3 crimp, length 1.0 m Two-mirror control

Mirror switch

- 08.3200.250  12 and 24V on-board voltage, size: \varnothing 26 x 59 mm One-mirror control
08.3200.233  12 and 24V on-board voltage, size: 42 x 42 x 54 mm (WxHxD) Two-mirror control



Camera Monitor Systems

Cameras



CMOS color cameras

Video system	NTSC or PAL
Sensor resolution	640 x 480 pixels (WxH)
Image format	NTSC: 720 x 486 pixels (WxH), PAL: 720 x 576 pixels (WxH)
Connector	MEKRA, Ø < 18 mm ADR tested, (IP69K)
Cable	ADR tested, oil and gasoline resistant, 0.5 m
Housing	Pressure-molded aluminium, painted black, dust proof and withstands high-pressure cleaning (IP69K)

Specifications

- Shock resistance 50G
- Operating voltage 9 V to 36 V
- Protection class IP69 K
- Minimum illumination: < 0.5 lux
- Power consumption: < 1W (< 3.5 W, with heating system on)
- Video output: FBAS 1Vpp at 75 Ω
- Operating temperature: -40 °C to +85 °C
- **Heated and extra hardened front glass**
- Storage temperature: -40 °C to +90 °C

Options (more on request)

Cubical housing 1

- Outside dimensions, excluding mounting bracket: 65 x 59 x 50 mm (WxHxD)
- Weight without bracket: app. 180 g

NTSC color camera

28.1301.007.099	Opening angle 70° (hor.)
28.1301.001.099	Opening angle 100° (hor.)
28.1301.005.099	Opening angle 100° (hor.), low distortion
28.1301.003.099	Opening angle 120° (hor.)

PAL color camera

28.1301.008.099	Opening angle 70° (hor.)
28.1301.002.099	Opening angle 100° (hor.)
28.1301.006.099	Opening angle 100° (hor.), low distortion
28.1301.004.099	Opening angle 120° (hor.)

Round housing 2

- Outside dimensions, excluding mounting bracket: 55 x 47 mm (WxD)
- Weight without bracket: app. 180 g



Camera Monitor Systems

Monitors

TFT color monitors

Screen	7" TFT 16:9
Video system	NTSC and PAL
Brightness control	Automatic day/night switching
Housing	Rugged plastic, black, UV resistant

Monitor MCM-2070 with integrated control box (ECU), system connection cable and monitor bracket

- Operating temperature: -20 °C to +70 °C
- Vehicle signal detection
- Contrast ratio: 300:1
- Menu-controlled camera mirror function
- Video input connector: Mini DIN
- Operating voltage: 12/24V DC via on-board power cable
- 4 camera inputs, split-screen functionality
- Maximum brightness: 350 cd/m²
- Outer dimensions: 182 x 124 x 39 mm (WxHxD)
- Resolution: 480 x 234 pixels (WxH)

Part No.: 08.5611.400



Monitor MCM-5003 with integrated control box (ECU), system connection cable and monitor bracket

- Operating temperature: -20 °C to +70 °C
- Vehicle signal detection
- Splashproof (IP65)
- Contrast ratio: 400:1
- LED background illumination
- Video input connector: Mini DIN
- Operating voltage: 12/24V DC via ECU
- 4 camera inputs, split-screen functionality
- Menu-controlled camera mirror function
- Maximum brightness: 400 cd/m²
- Outer dimensions: 197 x 138 x 32 mm (WxHxD)
- Resolution: 480 x 234 pixels (WxH)

Part No.: 08.1201.501.099



Monitor MCM-5047 with integrated control box (ECU), system connection cable and monitor bracket

- Operating temperature: -30 °C to +85 °C
- Vehicle signal detection
- Splashproof (IP65)
- Contrast ratio: 600:1
- LED background illumination
- Video input connector: AMP
- Operating voltage: 10-36V DC
- Resolution: 800 x 480 pixels (WxH)
- Menu-controlled camera mirror function
- Brightness: 500 cd/m²
- Outer dimensions: 188 x 120 x 45 mm (WxHxD)
- 4 camera inputs, split-screen functionality

Part No.: 24.1301.501.099 

Accessories:

Adapter cable AMP - MEKRA

09.5610.360

AMP - MEKRA 0,5 m



Camera Monitor Systems

Wireless video system and accessories



New-Wireless video system

Transmitter:

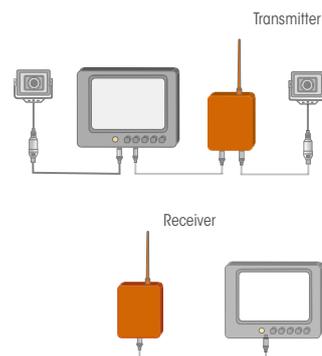
Connection for one camera, video output for monitor.

Power supply of the camera via transmitter, power supply of the transmitter via monitor or on-board power supply. Housing IP 69K

Receiver:

Connects to camera input on monitor. Power supply via monitor. Mixed operation with additional cameras connected to the monitor possible.

- Operating temperature: -40 °C to +85 °C
- Open-field range up to 500 m
- Further receivers possible
- Reliable image transfer
- Power input: 9V-36V DC via on-board power cable
- 5 channels selectable
- Split-screen mode operation possible (via monitor)
- Rugged design (IP69K)



Camera accessories

Camera bracket, shock-proof ABS plastic, black, UV resistant

- | | | |
|-------------|---|---|
| 20.5630.400 | Standard camera bracket, 90 x 100 x 73 mm (WxHxD) | 1 |
| 20.5631.400 | Design camera bracket, 125 x 102 x 73 mm (WxHxD) | 2 |
| 20.5620.601 | Standard camera bracket, 80 x 71 x 29 mm (WxHxD) | 3 |
| 20.5611.400 | Design camera bracket, 121 x 98 x 58 mm (WxHxD) | 4 |

Camera bracket, stainless steel

- | | | |
|-----------------|---|---|
| 11.1200.501.099 | Camera mounting bracket, 87 x 70 x 65 mm (WxHxD) | 5 |
| 11.1200.502.099 | Roofed camera bracket, 87 x 74 x 74 mm (WxHxD) | 6 |
| 20.5640.101 | Magnetic base for camera bracket 1, 3 & 4, rubberized, 66 x 66 x 19 (WxHxD) | 7 |



Cables

Connector system	MEKRA Ø < 18 mm, IP69K
Cable	oil and gasoline resistant

Camera monitor connection

Camera monitor direct connection cables

- | | |
|-----------------|-----------------------|
| 09.1201.007.099 | Mini DIN – MEKRA 5 m |
| 09.1201.006.099 | Mini DIN – MEKRA 11 m |
| 09.1201.008.099 | Mini DIN – MEKRA 16 m |
| 09.1201.009.099 | Mini DIN – MEKRA 21 m |



General Terms and Conditions

As of: 09/2013

I. General Provisions

1. The provisions of the contract between MEKRA Lang GmbH & Co. KG ("MEKRA Lang") and our orderers who are contractors as defined in para. 14 BGB are solely governed by these General Terms and Conditions. Our offers are exclusively meant for entrepreneurs as defined by Article 4 BGB (German Civil Code). Deviating business terms of the customer, even if they are known to us, shall not become a part of the contract. Our offers are always subject to change without notice. Our General Terms and Conditions of Sale and Delivery are considered accepted upon placement of order, at the latest upon receipt of goods. In the case of repeated business relations these General Terms and Conditions of Sale and Delivery also apply for all future transactions. Should individual provisions be or become completely or partially ineffective, then the validity of the other provisions shall thereby not be affected. MEKRA Lang and the customer shall agree upon a regulation the economic success of which shall be as close as possible to the ineffective one. Until such agreement the laws, administrative practice and judicature effective at the time of execution are to be applied.

II. Conclusion of Contract and Prices

1. By ordering merchandise the customer bindingly declares that he wants to buy the merchandise ordered. He shall be bound to this statement for two weeks. We are entitled to accept the offer of a contract underlying the order within two weeks upon receipt of the latter by us. The acceptance may be declared in writing, electronically, or by delivery of the goods to the customer.
2. The obligations in electronic commerce according to Section 312e, par. 1 sentence 1, Nos. 1 to 3, and sentence 2 of BGB (German Civil Code) are excluded.
3. The conclusion of the contract takes place subject to the correct and timely delivery by our sub-suppliers to us. This applies only in case we are not responsible for the non-delivery, especially in case of the conclusion of a congruent hedging business transaction with our sub-suppliers. The customer shall be informed about the non-availability of the product without delay, and the equivalent, insofar as already paid, shall be reimbursed immediately.
4. All contractual financial obligations are to be fulfilled solely in EURO.
5. Prices are understood to be net as ex factory or supply depot. Freight, packaging and import costs, customs duties and other additional taxes are payable by the customer.

III. Period of Delivery and Supply Commitment

1. Our written or electronic order confirmation shall be decisive for extent, type, and date of the delivery. Partial shipments shall be permitted.
2. A liability in meeting delivery deadlines determined as binding shall only be accepted under the condition of undisturbed flow of operations and distribution. In particular in cases of acts of God and other disruptive events at our facilities or those of our sub-suppliers or transport contractors, for example operational or traffic disruptions, fire, flooding, labour-, energy-, or traffic shortages, strikes, lockouts, official measures as well as technical or technological situations that considerably aggravate the execution of the contract, release us from liability in punctual delivery or give us the right to stop delivery without obligation for subsequent delivery.
3. If not agreed otherwise, we have the right to deliver earlier than the delivery deadline. Unless otherwise agreed upon, delivery effected by us one up to a maximum of two weeks after the stipulated delivery date shall not be considered as delayed.
4. Delivery deadlines shall be considered met when the goods have left the works or dispatch depot or the customer has received notice by expiration of the deadline of our readiness to deliver. Subsequent alteration of contract shall be cause for a reasonable extension of delivery deadlines.
5. In the case of contracts whose performance consists of several deliveries, non-performance, defective or delayed performance of one delivery remains without influence upon the other deliveries of the contract.
6. Default of payments, application for the opening of an insolvency proceeding, handing in of a state meant in lieu of an oath of disclosure in accordance with § 807 ZPO (German Code of Civil Procedure), temporary shortage of liquid funds, or public knowledge of a considerable deterioration of the financial circumstances of the customer shall entitle us to stop deliveries immediately and to deny performance of current contracts. At the same time we shall be entitled to make immediately due and payable those accounts receivable from the customer which are not due yet.

IV. Shipment, Passage of Risk

1. Unless otherwise agreed by the Parties, the choice of packaging, shipping routes and method of transportation is subject to our discretion.
2. The risk of accidental loss and accidental deterioration of the merchandise shall pass over to the customer upon handing it over, in case of a mail order purchase upon delivery of the matter to the forwarding agent, the carrier, or another person or institution determined to execute the shipment. If the customer is overdue in accepting, this shall be equal to a handing over of the merchandise.
3. Merchandise out of call orders shall be accepted within 3 months after issuance of the acknowledgement of order, unless otherwise agreed.
4. Insurance against breakage and transportation risks shall only be taken out upon special request and shall be billed.
5. Customs duties and other expenses, also the costs for payment of the necessary papers for import into the country of destination, shall be payable by the customer.

V. Payments, Terms of Payment

1. Invoices shall be payable:
 - a) within 14 days from date of invoice with 2 % cash discount of the accumulated invoice value;
 - b) within 30 days from date of invoice without cash discount of the accumulated invoice value.
2. Cash discount shall only be granted after all payment commitments out of earlier deliveries have been fulfilled and the invoice amount has been punctually paid to us in cash or has been credited to our account by the aforementioned due dates. The drawing of a bill of exchange can thus not lead to the granting of a cash discount. In case of cashless payment, especially when a cheque is submitted, the date of the credit entry shall be decisive. A cash discount cannot be granted in the case of payment or credit entry under reserve, with limiting conditions or any other restrictions. The customer shall assume all risks of method of payment. Invoices for tools are subject to immediate payment without cash discount.
3. Bills of exchange and checks shall only be accepted on account of payment. Corresponding credit entries are made only under the limiting condition of correct receipt of the complete amount due. We reserve the right to take in external or own acceptances. Costs and discount expenses are payable by the customer. We assume no responsibility for submission and protest. Protest imposed against the customer's own bills of exchange or non-immediate repayment of protested external bills of exchange shall entitle us to return all bills in circulation. At the same time we shall be entitled to make immediately due and payable those accounts receivable from the customer which are not yet due. Antedated checks shall not be accepted.
4. Interest on defaulted payment of 8% over the discount rate of the German Central Bank referred to in § 247 BGB (German Civil Law) shall be charged in the case of missed payment dates. The right of assertion of further damages caused by delayed performance and other claims shall remain reserved.
5. Advance and part payments are not subject to interest payments.
6. The customer shall only be entitled to offset or withhold payment if his counterclaim is undisputed or has been determined legally binding. The customer may execute a right of retention only if his counter claim is based on the same contractual relationship.
7. Customer and invoice numbers are to be given by the customer when invoices are balanced. Delays or incorrect booking resulting from failure to do so shall be payable by the customer.

VI. Retention of Ownership, Factoring

1. The delivered goods shall remain our property until payment of all claims has been received. The customer has the right to resell the proviso goods within the scope of proper and orderly course of business; however, a pledge or transfer by way of security is not permissible. The customer is required to ensure our rights in the case of resale of proviso goods on credit.
2. The accounts receivable by the customer based on the resale of the merchandise subject to reservation shall now already be transferred to us in the amount of the invoice. We hereby agree to accept this transfer. Regardless of the assignment, the customer shall retain the right to collect payment under the condition that he fulfils his responsibilities to us according to the underlying contractual relationship and does not fall into financial decline. Otherwise the customer must provide the information about the assignment necessary for collection upon our demand and notify his debtors of the respective assignment. In this case we reserve the right to collect the accounts receivable by ourselves.
3. A possible finishing or processing of the merchandise sold subject to reservation by the customer shall always take place on our behalf and by order of us, without any obligations resulting for us from this, however. In the case of processing of proviso goods with other goods not belonging to us, we are entitled to the co-owner portion of the resulting product corresponding to the value of the proviso goods in relation to the other processed goods. Insofar as here and in the following the value of the proviso goods is referred to, this value results from our invoice value.
4. Should the customer acquire sole ownership of the new product according to § 947 paragraph 2 BGB, it is agreed upon that the customer grants co-ownership in the proportion of the value of the processed, attached, or mixed proviso goods, and that he protects these free of charge.

5. In the case of resale of the proviso goods together with other goods, regardless of with or without processing, attachment or mixing, the assignment in advance agreed to above shall be valid only to the extent of the value of proviso goods that were resold together with the other goods. We shall be obligated to release on demand the securities entitled as provided above, if the value exceeds secured payments by 20 %.
6. The customer must immediately notify us and provide the material necessary for an intervention in the case of compulsory execution by third parties against the proviso goods or in case of claims assigned in advance. Any costs resulting from such intervention shall be payable by the customer.
7. The customer shall be obligated to adequately insure the merchandise sold subject to reservation against fire and burglary and has to prove such insurance to us on demand.

VII. Warranty

1. The period of limitation for any warranty claim shall be 24 months as from handover of the goods.
2. First of all, we shall remedy a defect or make a substitute delivery at our discretion. In case of failure to rectify defects or to substitute delivery, the customer can demand rescission of the contract or reduction of the payment. In case there is only a minor contract violation, especially if there are only minor defects, the customer shall not have the right of contract cancellation, however.
3. The customer must notify us in writing of any obvious flaws immediately, at the latest within 7 days after receipt of the goods, and must refrain from any eventual working of protested goods. Otherwise claims based on defects are excluded. The timely dispatch shall suffice for the observance of the warranty deadline. The full burden of proof for all claim prerequisites rests with the customer, especially for the defect itself, for the date of the establishment of the defect, and for the timeliness of the complaint about the defect.
4. Defects which could not be ascertained within this time span despite careful inspection are to be reported to us in writing immediately upon discovery. If the customer opts for a withdrawal from the contract because of a legal imperfection or a physical defect after a failed subsequent fulfilment, then he shall not be additionally entitled to a claim for compensation because of the defect.
5. If, after a failed subsequent fulfilment, the customer opts for a compensation of the damage, then the merchandise shall remain with the customer if this can reasonably be considered acceptable. The compensation is restricted to the difference between the purchase price and the value of the defective product. This shall not apply if we caused the contract violation maliciously.
6. Merchandise for which we have effected compensation shall become our property and is to be returned to us against reimbursement of costs.
7. Claims cannot be made for damages that resulted from the customer's culpably
 - a) improper handling or overstressing the purchased item or
 - b) altering the purchased item in a manner not agreed upon or
 - c) not following the instructions of the mounting or operating manual or
 - d) not observing the complaint and delivery responsibility according to points 3 and 4 above or
 - e) further using the purchased item after ascertaining the defect.

Natural wear and tear is excepted from the warranty.

VIII. Liability

1. In case of simply negligent violations of obligations our liability shall be restricted to an average damage predictable for the type of merchandise, typical for such a contract, and immediate. This also applies in case of simply negligent violations of our legal representatives or agents. We shall not be held liable in case of a simply negligent violation of nonessential contract obligations.
2. The liability by virtue of acceptance of a guarantee as well as due to product liability remains unaffected; the same applies in case of bodily harm or health impairment attributable to us or in the event of loss of life of the customer
3. Compensation claims of the customer because of a defect shall superannuate after one year from the delivery of the merchandise to the customer. This shall not apply if we can be charged with gross negligence as well as in case of bodily harm or health impairment attributable to us or in the event of loss of life of the customer.

IX. Returns

Properly ordered and delivered goods shall in principle not be taken back. Returns that have been agreed upon with us shall remain the exception, which additionally require the following pre-requisites to be met:

1. The products must have been acquired directly from us or from one of our works depots.
2. Flawless and unaltered condition of the goods.
3. In principle, return shall only be possible when the articles in question are still in our product range.
4. Return shipment must be „free domicile“ to our Ergersheim works or to the appropriate works depot with accompanying delivery note date and number. Value reduction for returns:
 - in the first year after delivery date / .10 % of the contract price
 - in the second year after delivery date / .25 % of the contract price
 - between the 3rd & the 5th year after deliv. date / .50 % of the contract price
 - merchandise over five years old - no return possible

Technical inspection and completion of the credit slip shall be carried out under consideration of eventual value reduction upon receipt of the articles. Freight costs, insofar as any occurred to us for the original shipping, reduce the remaining value.

X. Industrial Property Rights

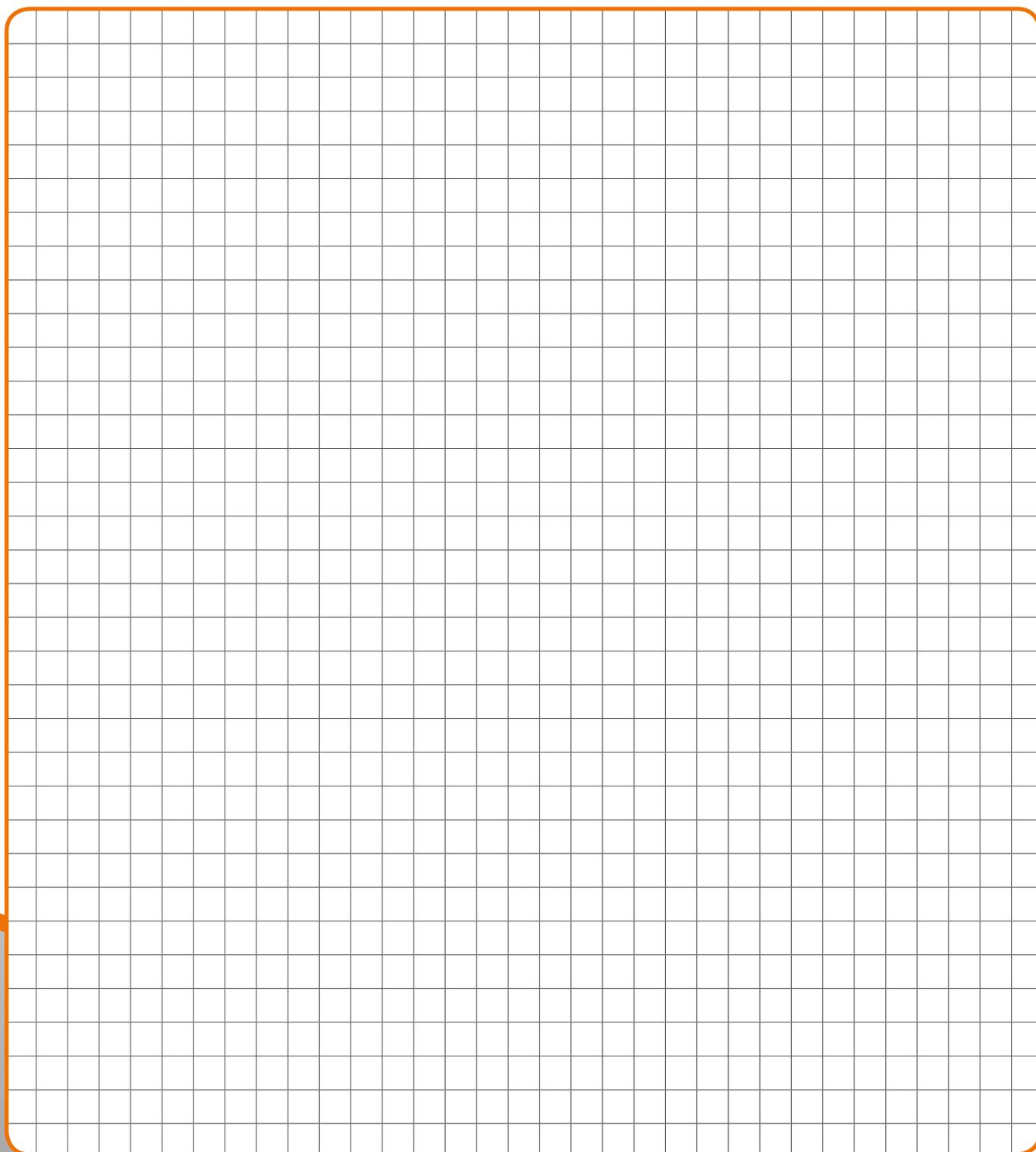
1. The customer is held liable to us for the exemption from industrial protection rights of third parties on articles ordered, indemnifies us against any possible claims of third parties and has to reimburse any damage to us possibly resulting from a violation of this obligation.
2. Our designs and design proposals are to be kept confidential and may not be passed on to third parties.
3. All drawings, construction plans, and samples which the customer has received, shall remain our intellectual property.

XI. Place of Fulfillment and Jurisdiction, Other Agreements

1. On principle, the product description of the manufacturer is understood to be decisive for the characteristics of the goods. Public statements, sales talks, or advertisements made apart from this do not represent a contractual description of the characteristics of the goods. Samples and specimens serve as approximate illustrative articles in terms of quality, measurements and colour. Legal claims cannot be inferred from this. Technical changes as well as alterations in shape, colour, and/or weight are reserved within reasonable scope.
2. If the customer receives a faulty assembly instruction, we shall only be obliged to furnish a faultless assembly instruction, and this only if the fault of the assembly instruction is in contradiction with a proper assembly.
3. The customer does not receive warranties in the legal sense of the word from us; warranties of the manufacturers, however, shall remain unaffected by this.
4. Place of fulfillment for our deliveries ex works shall be the delivery works, for delivery ex storage the warehouse. Place of fulfillment for all payments shall be Ergersheim / Bavaria, Germany.
5. The exclusive place of jurisdiction for all litigations from this contract shall be Fuerth / Bavaria, Germany. This also applies to lawsuits based on a cheque or bill of exchange.
6. These provisions shall be governed by the Law of the Federal Republic of Germany. The provisions of the UN Purchase Law shall not be applicable. The wording of the German language version of our „General Terms and Conditions of Sale and Delivery“ shall solely be decisive for these General Business Terms.
7. The special terms of our products published with the appropriate price lists shall additionally be applicable.
8. The customer itself shall be responsible to examine the suitability of the goods for the intended final usage.
9. German law (BDSG-Federal Data Protection Law) requires us to inform you that all data of our customers are electronically saved.

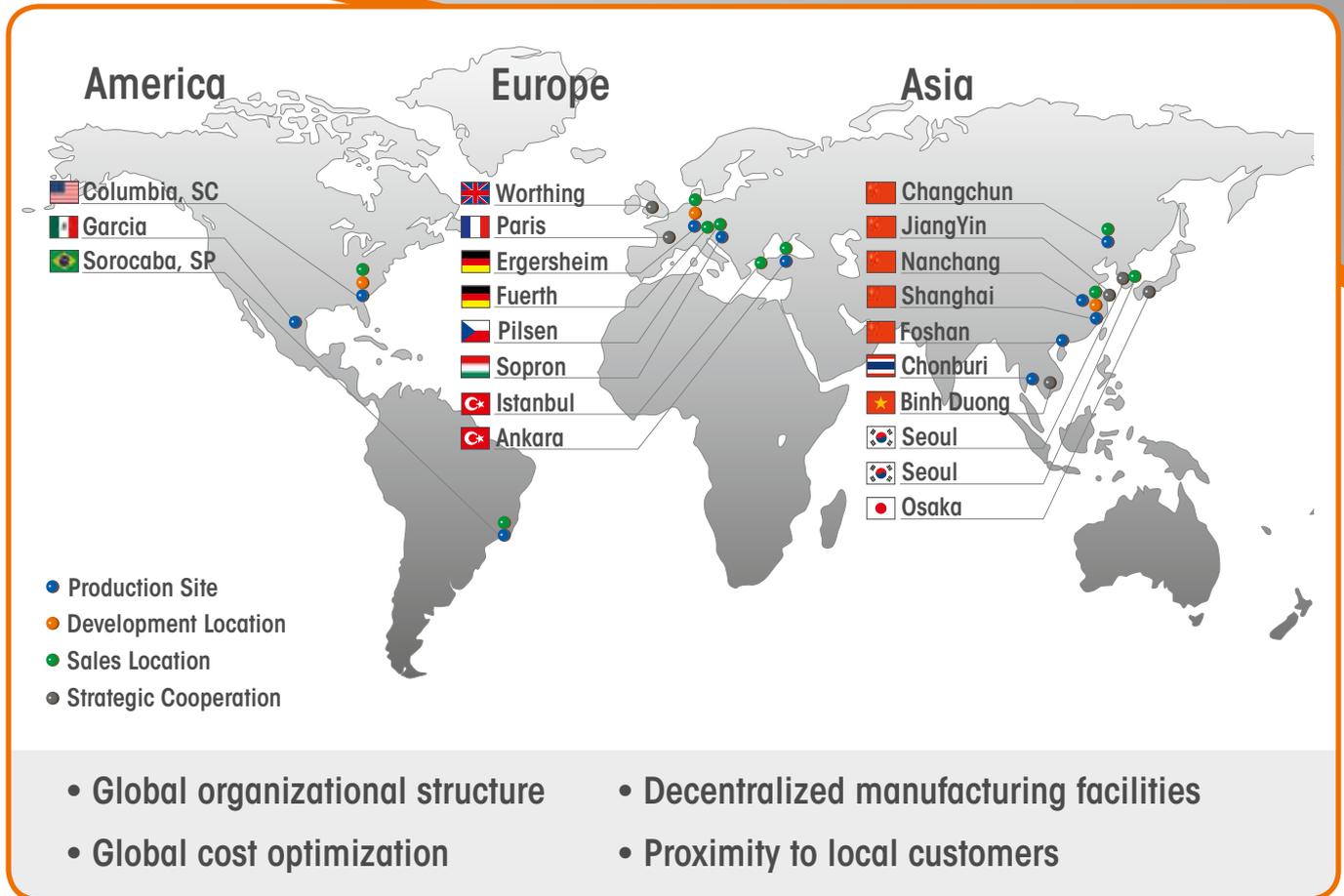
Appendix

Space for your creative ideas



Locations

Worldwide



- Global organizational structure
- Decentralized manufacturing facilities
- Global cost optimization
- Proximity to local customers

MEKRA Lang is the leading manufacturer of mirror systems for commercial vehicles as well as specialized camera systems for automotive applications. This family enterprise was founded in 1932 in Fürth by Hans and Frieda Lang and is now guided by the 2nd and 3rd generation of the Lang family. With 20 locations in 14 countries, the Lang group of companies employs about 2000 employees around the globe.



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