FEHLING MICS MV SUPERFLEX atrial retractor
MTG-0..... MICS MV SUPERFLEX, atrial retractor, 30mm MTG-1..... MICS MV SUPERFLEX, atrial retractor, 37.5mm MTG-2..... MICS MV SUPERFLEX, atrial retractor, 45mm
Accessories MTI-9 ..... Fixation clamp for MTG-0/1/2 atrial retractor MRN-3A..... Blade guide for instruments with MV design, 223 mm DBC-4 ..... Johns-Hopkins applying forceps, 245 mm EEP-7H..... CONCEPT instrument holder without base, overall length 843 mm EEK-1F ..... Operating table adapting clamp Ø 16 mm, adjustable angle

⚠	This instrument resp. medical device is non-sterile when delivered. It is to be reprocessed prior to use. The instrument must undergo risk assessment according to the RKI Guidelines (non-critical, semi-critical, critical A/B/C) prior to reprocessing. Only trained medical personnel may use, reprocess or dispose of the MICS MV SUPERFLEX atrial retractor! The MICS MV SUPERFLEX atrial retractor is intended for re-use.

1) Intended purpose

Retractors and retractor components, which are used invasively and for short periods in surgery, serve to separate or hold back various tissue structures, such as skin, bone, muscles and organs.

Additional information regarding the intended purpose

Duration of application: the MICS MV SUPERFLEX atrial retractor is intended for short-term use.

Field of application: retractors and retractor components are used for all patients where tissue has to be retracted for a short period of time (max. 24 hours) to improve visibility of the underlying tissue for the surgeon.

User profile: retractors and retractor components may only be used by medically trained personnel (e.g. specialist physicians).

Application environment: retractors and retractor components are only to be used in controlled environments (e.g. OR).

2) Indications

Surgical procedures that require the temporary spreading and holding of various tissue structures, such as skin, bones, muscles and organs, to reach the body structure requiring treatment. The choice of retractor and accessory components depends on the anatomical and physiological conditions as well as the field of application. Here care should be exercised to ensure that the retractors or retractor blades used are of the correct size and have adequate stability.

The MICS MV SUPERFLEX atrial retractor in particular is intended for

- Retracting soft tissue from the surgical site for all procedures with limited soft tissue incisions using a separate incision
- Retraction of soft tissue from the surgical site for all procedures with limited soft tissue incisions using the main incision
- All types of surgical sites in which soft tissue must also be partially retracted under tension
- for correct exposure without the field of vision being restricted by the retractor.

3) Contraindication

All applications that run counter to the physical and/or mechanical properties of the individual retractor model are contraindicated. There are no generally applicable contraindications for the use of retractors.
Nevertheless, increased risks must be taken into account which could result from the anatomical and physiological conditions as well as the clinical picture of the patient.

4) Possible adverse effects

In medical literature, the following adverse effects are described that can possibly occur during the intended use of retractors:

- Infections
- Impaired wound healing
- Lesions of structures (tissues, nerves, vessels)
- Necroses

In particular, when using the MICS MV SUPERFLEX atrial retractor as intended during or after performing minimally invasive techniques on the heart (method-specific complications) such as:

- postoperative atrial fibrillation
- postoperative cardiac arrhythmias
- tissue trauma

and in rare cases

- Infections
- strokes

have been observed.

⚠	Medical devices may, for example, contain chromium, nickel and/or titanium. The materials used are biocompatible, however they may cause allergic reactions or incompatibilities.

5) Prior to use

The FEHLING INSTRUMENTS MICS MV SUPERFLEX atrial retractor is non-sterile when delivered and must be cleaned and sterilized by the user before initial use and every time before they are used thereafter (see 6) Reprocessing).

⚠	Perform a safety check prior to each use. Check for cracks, fractures or mechanical malfunctions and missing components (see 6) Reprocessing under "Maintenance, Checking and Testing").
⚠	The MICS MV SUPERFLEX atrial retractor must be handled with care during storage, transportation and cleaning! Avoid striking or applying pressure to the MICS MV SUPERFLEX atrial retractor so as not to cause any consequential damage! Do not overstrain functional parts!
⚠	Use only sterilized products of sound quality!

⚠	MICS MV SUPERFLEX atrial retractors consist of an austenite nickel-titanium shape memory alloy. They can be flexibly deformed at room temperature and (instantly) regain their initial shape after removal of the deforming force. When deforming the retractor during use, do not bend and do not go below the permissible minimum diameter of 30 mm. Bending the retractor too sharply can result in permanent deformation or irreparable kinks in the material that compromise the retractor's function.

6) Reprocessing	
⚠	The medical device is to be reprocessed prior to use. It must undergo risk assessment according to the RKI Guidelines (non-critical, semi-critical, critical A/B/C) prior to reprocessing.
⚠	The national legal regulations, national and international standards and guidelines as well as the company's own hygiene regulations for reprocessing are to be complied with.
⚠	The applicable national regulations must be followed for the reprocessing of instruments used in patients with Creutzfeldt-Jakob disease (CJD), suspected CJD or possible variants.
⚠	The instruments may only be used, reprocessed and disposed of by qualified medical personnel.
⚠	Handle instruments with care during storage, transport and cleaning! Avoid striking and applying pressure to instruments, so as not to cause any consequential damage! Do not overstrain functional parts!
⚠	Do not clean titanium or titanium-containing instruments with oxidative processes (processes using hydrogen peroxide H_2O_2, e.g. Orthovario or Oxivario from Miele). By dissolving titanium, the application of these procedures leads to the destruction of titanium or titanium-containing instruments.
Limitations on reprocessing	Frequent reprocessing has little impact on these instruments. The end of product life is normally determined by wear and tear and damage occurring through use (e.g. damage, illegible marking, functional failure - also see "Maintenance, Checking and Testing").
General information on reprocessing	Reprocessing is based on a validated procedure. All the cleaning steps mentioned (manual pre-cleaning, automated/manual cleaning, manual disinfection, and sterilization) were validated with the respective parameters specified in each case and listed under "Validated procedure". The recommended reprocessing agents (detergent: Neodisher® MediClean forte (Dr. Weigert); disinfectant: Korsolex® med AF (Bode Chemie GmbH)) were used for validation. Both water of potable water quality and fully deionized water (deionized water, demineralized, microbiologically at least of potable water quality) are used for cleaning. Automated reprocessing is preferable to manual cleaning due to a better and safer cleaning result. There is also the option of cleaning our instruments with other tested and approved chemicals which have been recommended by the chemical manufacturer with regard to their material compatibility. Please always observe the manufacturer's information on concentration, exposure time, temperature and renewal of the detergents and disinfectants. All instructions for use of the chemical manufacturer must be strictly observed. Otherwise, this can

	lead to visual material changes or material damage, such as, for example, corrosion, fractures or premature aging.
Initial treatment at the place of use	Pre-cleaning: ensure that blood, tissue and drug residues are removed from the instruments with a disposable cloth/paper wipe immediately after completion of the procedure and that they undergo mechanical cleaning immediately. After completion of initial treatment of the instruments, visual inspections must be performed to ensure that the instruments are complete. The instruments must be transported from the place of use to the place of reprocessing such that neither the user, third parties, the environment nor the medical devices are endangered or damaged (placement in closed, puncture-proof containers and - if necessary - use of protective caps).
Preparation prior to cleaning	It is recommended to reprocess the instruments immediately after use because it is very difficult to remove dried residues from instrument parts that are difficult to access. Do not immerse in normal saline solutions (risk of pitting or stress corrosion). Instruments which were connected to each other during use must be disassembled back into their original condition before cleaning.
Disassembly	See 10) Disassembly
Manual pre-cleaning	<u>Validated procedure:</u> Equipment: Basin Soft brush Water spray gun (or similar) Detergent: Neodisher® MediClean forte (Dr. Weigert) <u>Procedure/Parameters:</u> • Rinse instruments, if possible in disassembled condition, under running cold water of potable water quality (<40°C) until all visible contamination has been removed. Remove stubborn contamination with a soft brush (not a wire brush!). • Cavities, crevices, slits and lumens must be rinsed intensively (>10 seconds) with cold water (potable water quality, <40°C) using a water spray gun (or similar). • Place the products for 10 - 30 minutes in a solution with 0.5 - 2% Neodisher® MediClean forte with water (potable water quality, <40°C). • Use only an approved solution of a detergent that has no protein-fixing effect. Follow the instructions of the detergent and disinfectant manufacturer. • Ensure that all areas of the instrument come into contact with the solution. • If necessary, the moving parts of the instrument are moved back and forth in the cleaning bath. • During the exposure time, use appropriate brush (not a wire brush) to remove coarse contamination. • Rinse the instruments for one minute in cold deionized water (see "General Information on Reprocessing") and, if applicable, move movable parts back and forth.
Cleaning/ Disinfection	If possible, a washer/disinfector according to DIN EN ISO 15883, which uses thermal disinfection, is to be preferred.

Cleaning: Automated	Avoid overfilling instrument trays and washing trays - use only suitable instrument holders. When placing instruments in the sterilization baskets and removing them afterwards, take special precautions to ensure that the tips do not become stuck in the mesh. <u>Validated procedure:</u> Equipment: Washer-disinfector G 7835 CD (Miele) / PG 8535 (Miele) Cleaning program: Des-Var-TD (G 7835 CD) Detergent: Neodisher® MediClean forte (Dr. Weigert) <u>Preparation:</u> • Instruments with joints are to be placed in the device such, that the joints are opened or disassembled if possible, and that the water can flow from the cavities and sac holes. • If applicable, loosen springs • Ensure that the inside of all cavities is also completely rinsed. • Ensure that no areas are left unwashed. • Connect the Luer connections of the instruments, if present, to the Luer Lock flushing attachment of the WD. <u>Procedure/Parameters:</u> • Pre-wash for 3 minutes with cold water (potable water quality, <40°C) • Emptying • Clean for 10 minutes with a solution of 0.5 - 2% Neodisher® MediClean forte in water (potable water quality) at 55°C • Emptying • Rinse for 2 minutes with water (potable water quality, <40°C) • Emptying • Rinse for 1 minute with cold deionized water (<30°C) • Emptying • Thermodisinfection for 5 minutes with deionized water (>90°C) • Dry for 30 minutes (90°C) After cleaning in the machine, inspect cavities, blind holes, etc. for visible contamination. If necessary, repeat the cycle or clean manually.
Cleaning: Manually	<u>Validated procedure:</u> Equipment: Basin Soft brush Water spray gun (or similar) Bandelin Sonorex Digitec Detergent: Neodisher® MediClean forte (Dr. Weigert)

	Procedure/Parameters: • Place instruments, if possible in disassembled condition, in cold water (potable water quality, <40°C) for 10 minutes. • Move any movable parts, if present, back and forth over the entire range of movement. • Use a soft brush (not a wire brush) to clean the instruments until no more contamination is visible. • Rinse the instruments for at least 20 seconds with a water spray gun (or similar). Ultrasonic cleaning: • Clean for 10 minutes at <40°C with 0.5 - 2% cleaning solution at 35 kHz • After ultrasonic cleaning, rinse the instruments with a water spray gun (or similar) for at least 20 seconds. • Rinse the instruments for at least 10 seconds with water (potable water quality, <40°C). • Deionized water (<40°C) is to be used for the final rinse. Rinse the instruments with deionized water for at least 30 seconds. Ensure that no residues remain on the products.
Disinfection: Manually	Consult the instructions on the label when selecting a disinfectant (see chemical manufacturer information). Validated procedure: Equipment: Basin Bandelin Sonorex Digitec Disinfectant: Korsolex® med AF (Bode Chemie GmbH) Procedure/Parameters: • After cleaning, place the products in an ultrasonic bath (35 kHz, <40°C) with a suitable disinfectant solution (e.g. 0.5% Korsolex® med AF) for 5 minutes. Ensure that all surfaces are wetted with the disinfectant. If applicable, move the moving parts in the disinfection bath before switching on the ultrasonic cleaner. • After disinfection, rinse all products thoroughly with deionized water (<40°C) for at least 1 minute to remove the disinfectant and, if applicable, move the moveable parts of the instrument back and forth. • Ensure that no residues remain on the products. • Dry with sterile, oil-free compressed air.
Drying	If drying is to be achieved as part of the cleaning/disinfection cycle, do not exceed 120°C. Then dry with suitable compressed air in accordance with Robert Koch Institute (RKI) recommendations. Pay particular attention to the drying of difficult-to-access areas.
Assembly	See 9) Assembly

Maintenance, checking and testing	For instruments with movable components that are exposed to friction (e.g. joints), an instrument oil based on paraffin/white oil (according to the valid European or United States Pharmacopoeias) which is biocompatible, steam sterilizable and steam-permeable is to be applied. Such places are additionally marked by a corresponding symbol of an oil can. Instruments must not be treated with care products containing silicone. These can lead to stiffness and question the effect of steam sterilization. Perform a safety check of the instruments prior to each use. When doing so, check for sharp edges, cracks, fractures and mechanical malfunctions and missing components. Check instruments with movable parts for smooth operation (avoid excessive play). Check locking mechanisms. All instruments: use a magnifying lamp to visually inspect the components for damage and wear and tear. In particular, inspect the critical points on moving parts and in the working area. Defective or damaged instruments, or those with illegible markings, must be sorted out and cleaned and disinfected before being returned to the manufacturer. Repairs may only be carried out by the manufacturer or by workshops authorized by the manufacturer. A verification form for this process is available from the manufacturer. Instruments that can no longer be repaired must be disposed of as scrap metal in accordance with hospital practice. In the case of surgical instruments with tips or sharp edges in particular, safe storage in a closed, puncture and break-proof disposable container must be ensured. Do not use damaged instruments!
Packaging	Singly: In accordance with the standard series DIN EN 868, DIN EN ISO 11607, and DIN 58953. Sets: sort instruments into dedicated trays or place them in general-purpose sterilization trays. Pack the trays appropriately using a suitable procedure.
Sterilization	Steam sterilization in a fractionated vacuum process in a device complying with DIN EN 285 and DIN EN ISO 17665. In order to prevent staining and corrosion, the steam must be free of contaminants. The recommended limits for contaminants for feed water and steam condensate are defined by DIN EN 285. <u>Validated procedure:</u> Equipment: Tuttnauer Autoclave Type B 3870 EHS / Lautenschläger ZentraCert <u>Procedure/Parameters:</u> Cycle type: 3 pre-vacuum phases Sterilization temperature: 132 – 134°C Holding time: 4 – 5 minutes Drying time: 20 minutes When sterilizing more than one instrument in a sterilization cycle, do not exceed the maximum load of the sterilizer (see manufacturer's instructions).

Storage	In accordance with §4 of the German Medical Devices Operator Ordinance (MPBetreibV) and standard series DIN EN 868, DIN EN ISO 11607, and DIN 58953. Instruments must be stored dry, at room temperature, clean, protected from damage and mechanical influences (avoid condensation, damage). Always keep instruments, if applicable, in a released state. This counteracts premature fatigue of the spring tension. Instruments must be transported to their place of use in a closed, puncture-proof sterile container.
Disposal	This product is made of nitinol and steel. These are to be cleaned prior to disposal. Disposal can be performed at a scrap metal recycling facility. To protect employees, care must be taken to ensure that any pointed tips or sharp edges are protected.

The instructions listed above were validated by the medical device manufacturer as suitable for preparing a medical device for reuse. It is the responsibility of the reprocessor to ensure that the reprocessing actually performed using equipment, materials, and personnel in the reprocessing facility achieves the desired results. This normally requires validation and routine monitoring of the process. Likewise, any deviation from the provided instructions on the part of the reprocessor should be properly evaluated for effectiveness and potential adverse consequences.

⚠	Any modification to the device or any deviation from these Instructions for Use will result in exclusion of liability! Subject to change without notice.

7) Configuration and application

The MICS MV SUPERFLEX atrial retractors (Fig. 1) consist of an austenite nickel-titanium shape memory alloy. They can be flexibly deformed at room temperature and (instantly) regain their initial shape after removal of the deforming force.

The MICS MV SUPERFLEX atrial retractor consists of a flexible retractor mesh (a) with an axially movable joint section (b).

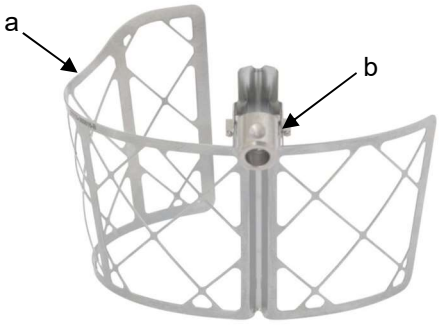
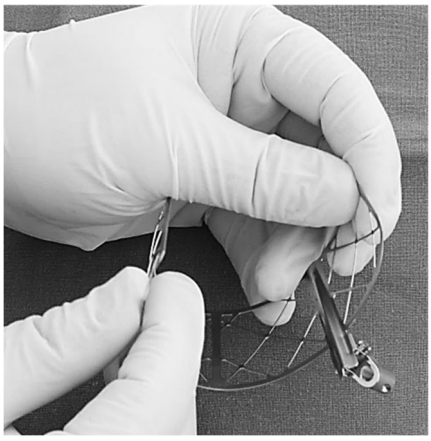
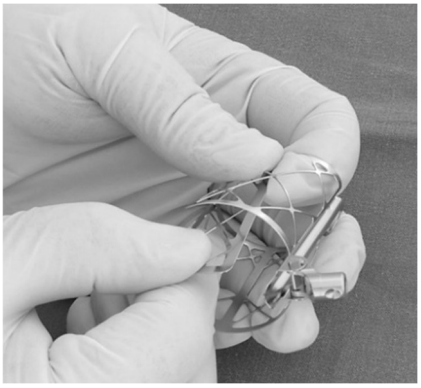


Fig. 1: MTG-0/1/2

The MICS MV SUPERFLEX atrial retractor in particular is used for retraction of soft tissue in circular and oval incisions, especially in MIC-OPs.

Based on the specific patient anatomy and according to the field of application, the MICS MV SUPERFLEX atrial retractor is rolled up carefully. The rolled-up retractor is then grasped with the fixation clamp and, if necessary, with the application forceps and positioned in the soft tissue to be retracted.

⚠	Use only sterilized products of sound quality!
⚠	Prior to inserting the retractors, ensure that the surgical field has been prepared accordingly beforehand.

⚠	Before using retractors, ensure that their functionality is not impaired and that there is no damage!
⚠	Medical devices made of ferromagnetic materials must not be exposed to either a magnetic field or external electromagnetic influences.
⚠	Medical devices containing metals are electrically conductive and must not be exposed to a power source or external electrical influences.
⚠	The choice of retractors depends on the anatomical and physiological conditions as well as the field of application. Here care should be exercised to ensure that the retractors used are of the correct size and have adequate stability.
During use	
⚠	When inserting the retractors, ensure that no tissue structures are unintentionally damaged (especially nerves and blood vessels)!
⚠	Too long and too high pressure on the tissue can cause necroses and other lesions!
⚠	Excessive load can cause plastic deformation or breakage of the retractors!
Preparation of the MICS MV SUPERFLEX atrial retractor	
Rotate the two retractor ends against each other (Fig.2).	 Fig. 2
⚠ When rolling into a scroll, ensure that the side with the greater expression of the contour is rolled up from the inside (Fig. 3).	 Fig. 3

Roll up the retractor up to a diameter of about 30 mm and fixate by hand (Fig. 4).

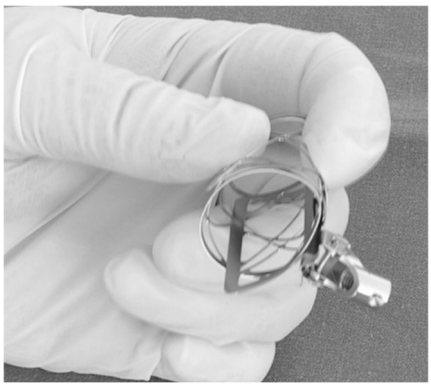


Fig. 4

The MTI-9 © fixation clamp is used to fixate the MICS MV SUPERFLEX atrial retractor (d) in a rolled up condition for easy insertion into the site. The retaining pins are anchored in the spaces between the retractor tissue.

⚠ The MTI-9 fixation clamp (c) must be fixated with the retaining pins facing outwards as shown in Figure 5. This is the only way to ensure later removal without difficulties.

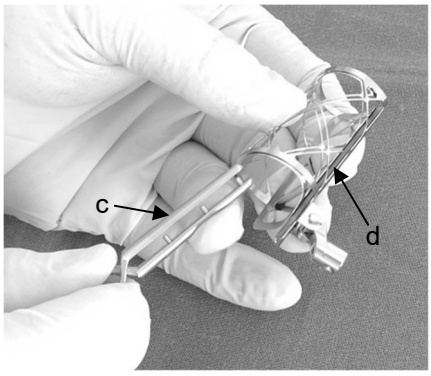


Fig. 5

⚠ The fixation clamp MTI-9 is intended **exclusively** for fixing the rolled up condition of the MICS MV SUPERFLEX atrial retractor!
A deviating application must not be performed under any circumstances!
Life-threatening hazard when perforating vessels!

Figure 6 depicts the rolled up fixated retractor (d) with fixing clamp (c).

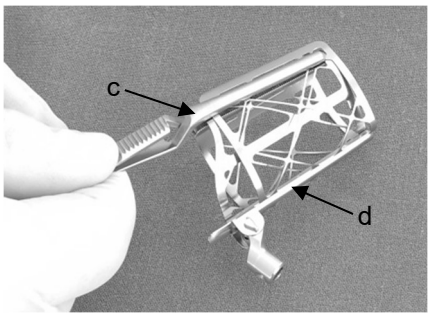


Fig. 6

Figure 7 depicts an alternative fixation of the rolled-up retractor.
The two proximal retractor ends are fixed to the outer and inner frames of the retractor (d) with suture material (e). This connection is severed with a scalpel to expand the retractor. The suture material (e) is removed immediately, e.g. with forceps.

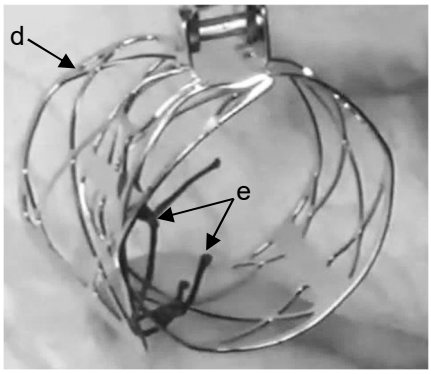
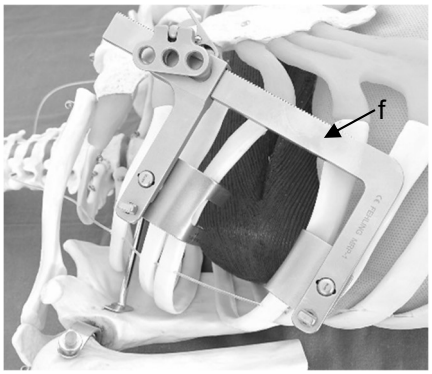
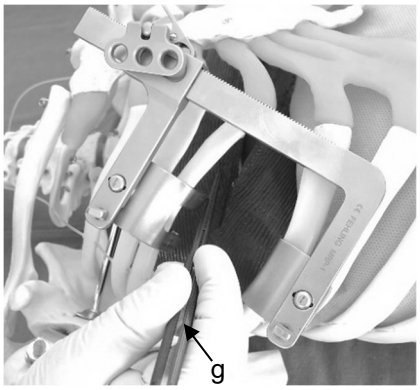
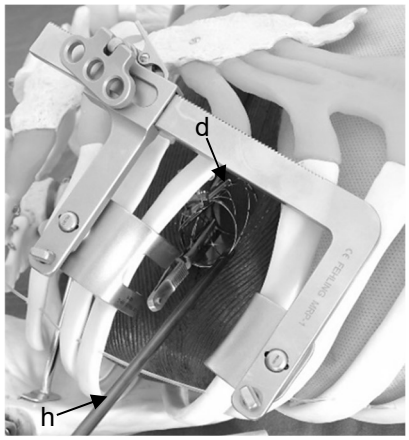
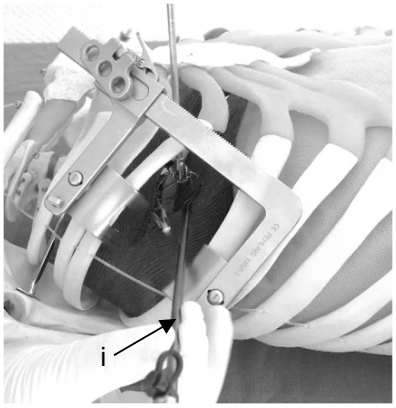


Fig. 7

Insertion of the MICS MV SUPERFLEX atrial retractor	
Minimally invasive access, e.g. with the aid of a MRP-1 MICS intercostal retractor (f) (Fig. 8) or a polymer soft tissue retractor.	 Fig. 8
Incise the tissue to be spread and pull apart, e.g. with forceps (g), to insert the rolled up retractor into the atrium (Fig. 9).	 Fig. 9
Position the rolled up retractor (d) in the soft tissue to be retracted using a sufficiently strong needle holder (h) (e.g. MRG-2 or MRG-9) (Fig. 10). It is essential to prepare the retractor before positioning in the soft tissue as described in "Preparation of the MICS MV SUPERFLEX atrial retractor".	 Fig. 10
To retain and adjust the MICS MV SUPERFLEX atrial retractor in the site, insert the MRN-3A blade guide (i) either through an additional transthoracic incision or through the main incision (Fig. 11). The MRN-3A blade guide (i) is screwed into the thread of the movable joint of the retractor up to the threaded stop.	 Fig. 11

Fine adjustment of the retractor is performed in the site using the transthoracic MRN-3A blade guide (i) (Fig. 12). The retractor can be swiveled by ±15° (Figs. 12a and 12b).

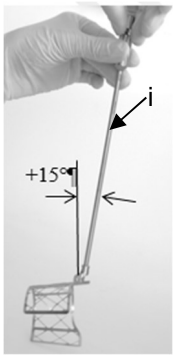


Fig. 12a

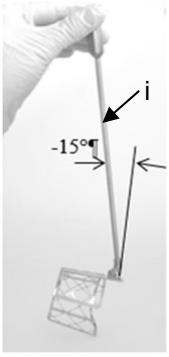


Fig. 12b

The retractor can also be fixated externally using the transthoracic blade guide, e.g. with the CONCEPT EEP-7H instrument holder.

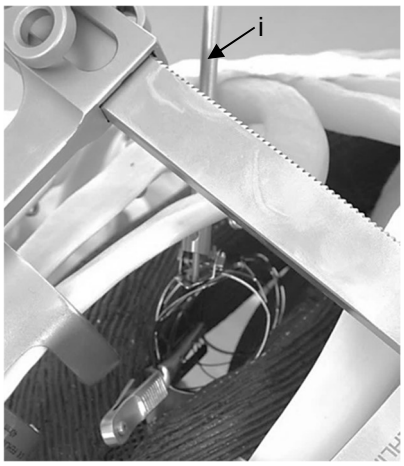


Fig. 12

Release the MTI-9 fixation clamp with the Johns Hopkins DBC-4 applying forceps (j) to slacken the retractor and thus spread the surrounding tissue (Fig. 13).
In the case of retractors fixated with suture material, this is now severed and removed.

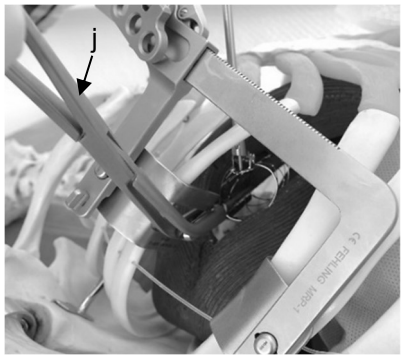


Fig. 13

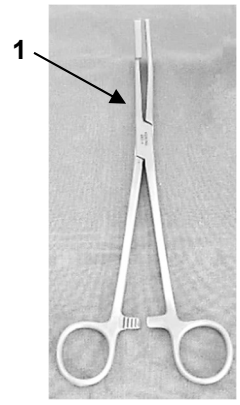
⚠ Do not kink the retractor or damage it by using unsuitable tools (fig. 14).

Fig. 14

Extraction of the MICS MV SUPERFLEX atrial retractor from the site	
Roll up the MICS MV SUPERFLEX atrial retractor, for example, with the aid of two needle holders (h), and extract it from the site (Fig. 15).	 Fig. 15
⚠	Do not extract the MICS MV SUPERFLEX atrial retractor in an open and released condition, **risk of injury** (lesion of the surrounding tissue)!

8) Required accessories

The accessories listed in Table 1 are required for application of the SUPERFLEX atrial retractor. SUPERFLEX atrial retractors are stand-alone instruments and therefore a combination with other products is not intended.



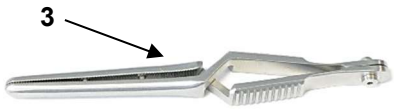


Table 1: List of necessary accessories

	Article no.	Description
1	DBC-4	Johns-Hopkins applying forceps, 245 mm
2	EEP-7H	EEP-7H CONCEPT instrument holder without base, overall length 843 mm
3	MTI-9	Fixation clamp for MTG-0/1/2 atrial retractor
4	MRN-3A	Blade guide for instruments with MV design, 223 mm
5	EEK-1F	Operating table adapting clamp Ø 16 mm, adjustable angle

9) Assembly

Assembly of the SUPERFLEX atrial retractor is not necessary.

To assemble and disassemble the blade guide please follow the assembly instructions M36.

To assemble and disassemble the OP table adapting clamp please follow the assembly instructions M33.

10) Disassembly
Disassembly of the SUPERFLEX atrial retractor is not necessary.

11) Obligation to report serious incidents
The user is obliged to report serious incidents relating to the medical device to the manufacturer per e-mail to vigilance@fehling-instruments.de or via the report form at https://www.fehling-instruments.de/en/complaint/ and the competent authority of the Member State where the user is registered.

Symbols		
In as far as the medical device or medical device label or instructions for use are labeled, the symbols have the following meaning:		
 Manufacturer	 Instructions for Use are to be observed	 Warning
 Article number	 Batch code	Serial number
 CE labeling	 CE labeling	 Oil can for points to be lubricated

To contact the manufacturer:	
	FEHLING INSTRUMENTS GmbH & Co. KG Hanauer Landstr. 7A 63791 Karlstein, Germany Tel.: +49 (0) 6188-9574-40 Fax: +49 (0) 6188-9574-45 E-mail: info@fehling-instruments.de www.fehling-instruments.de